PD-AAP-531
ISN-30345

42.

PROJECT COUNTRY: Togo

PROJECT TITLE: Togo Animal Traction Development Project (693-0218)

FUNDING: $4,990,000(Grant)

LIFE OF PROJECT: 5½ YEARS (Initial obligation FY-82) PACD March 31, 1988.

IEE PREPARED BY: for
Vernita Fort
REDSO/WA Natural Resources Advisor

DATE: September 1982

ENVIRONMENTAL ACTION RECOMMENDED:

A. Categorical exclusion for: (1) establishment of the revolving fund where AID does not reserve the right to review and approve individual loans made to farmers for instituting animal traction farming packages, (2) monitoring and evaluation, (3) controlled applied agricultural research, (4) institution building;

B. Deferred recommendation on: (1) well development; (2) building construction, (3) rice production in the bottomlands; (4) animal grazing

C. Negative determination on all other project activities.

GUIDANCE FOR PROJECT IMPLEMENTATION: This IEE not only reviews environmental effects of certain project elements. It also provides critical guidance and directives on the development of other project elements that must be followed to maintain the validity of the project and the IEE recommendation, and to keep environmental problems to a minimum.

Concurrence: _____ Date_____
John Lundgren
AID Representative
USAID/Togo

BUREAU ENVIRONMENTAL OFFICER'S DECISION: George Thompson

Approved: _____

Disapproved: _____

Date: 9/22/82

Clearance: Timothy Bork, GC/AFR_____ Date_____

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT PAPER FACESHEET

1. TRANSACTION CODE: A (A = ADD, C = CHANGE, D = DELETE)

PP

2. DOCUMENT CODE: 3

3. COUNTRY/ENTITY: TOGO

4. DOCUMENT REVISION NUMBER:

5. PROJECT NUMBER (7 digits): 693-0218

6. BUREAU/OFFICE: A. SYMBOL: AFR; B. CODE: 06

7. PROJECT TITLE (Maximum 40 characters): TOGO ANIMAL TRACTION DEVELOPMENT

8. ESTIMATED FY OF PROJECT COMPLETION: FY 87

9. ESTIMATED DATE OF OBLIGATION: A. INITIAL FY 82; B. QUARTER 4 (Enter 1, 2, 3, or 4); C. FINAL FY 86

10. ESTIMATED COSTS ($000 OR EQUIVALENT $1 –)

A. FUNDING SOURCE	FIRST FY B. FX	FIRST FY C. L/C	FIRST FY D. TOTAL	LIFE OF PROJECT E. FX	LIFE OF PROJECT F. L/C	LIFE OF PROJECT G. TOTAL
AID APPROPRIATED TOTAL						
(GRANT)	(280)	(820)	(1,000)	(2,524)	(2,466)	(4,990)
(LOAN)	( )	( )	( )	( )	( )	( )
OTHER U.S. 1.						
OTHER U.S. 2.						
HOST COUNTRY		283	283		1,670	1,670
OTHER DONOR(S)						
TOTALS	280	1,183	1,466	2,524	4,136	6,660

11. PROPOSED BUDGET APPROPRIATED FUNDS ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE C. GRANT	PRIMARY TECH. CODE D. LOAN	E. 1ST FY 82 F. GRANT	E. 1ST FY 82 G. LOAN	H. 2ND FY 83 I. GRANT	H. 2ND FY 83 J. LOAN	K. 3RD FY 84 L. GRANT	K. 3RD FY 84 M. LOAN
(1) ADFN	213	220		1,000		1,000		1,000	
(2)									
(3)									
(4)									
TOTALS				1,000		1,000		1,000	

A. APPROPRIATION	N. 4TH FY 85 O. GRANT	N. 4TH FY 85 P. LOAN	Q. 5TH FY 86 R. GRANT	Q. 5TH FY 86 S. LOAN	LIFE OF PROJECT T. GRANT	LIFE OF PROJECT U. LOAN
(1)	1,000		990		4,990	
(2)						
(3)						
(4)						
TOTALS	1,000		990		4,990	

12. IN-DEPTH EVALUATION SCHEDULED: MM 01 YY 85

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PID FACESHEET DATA, BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? IF YES, ATTACH CHANGED PID FACESHEET.

1 (1 = NO, 2 = YES)

14. ORIGINATING OFFICE CLEARANCE

SIGNATURE

TITLE: AID REPRESENTATIVE, Lome, Togo

DATE SIGNED: MM 09 DD 02 YY 82

15. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MM 09 DD 08 YY 82

AID 1330-4 (3-76)

TOGO ANIMAL TRACTION DEVELOPMENT

(693-0218)

PROJECT PAPER

I. Facesheet

Action Memorandum

Project Authorization

Waivers

Abbreviations

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II. Project Description

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C. Project Inputs and Outputs

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B. Technical

C. Social

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Note by the Project Paper Design Team: If the PP for the Togo Animal Traction Development project seems long, it is not intentionally so. Rather, the design team decided early in the performance of their task to try and come up with a PP that would serve not merely as a means to an expeditious AID review and approval, but primarily as a working document. This PP in its present form, should be able to be used as reference material by the project technical assistance team and to the appropriate AID backstop officers, throughout the course of activity implementation.

One further word. This is a very conservative document. Assumptions are made on the margin. While the design team does not always adapt the worst-case scenario, neither has it indulged itself in wild speculation and optimism about the opportunity for successful realization of project objectives. Costs are consistantly valued on the high side; benefits are estimated on the low side. We believe this has made for an honest and workable document and project.

ACTION MEMORANDUM FOR THE ASSISTANT ADMINISTRATOR FOR AFRICA

FROM : AFR/DR, Norman Cohen

SUBJECT : Togo Animal Traction Development (693-0218)

Request for Source/Origin Waiver for Motor Vehicles

Problem: Your approval is required to authorize a source/origin waiver for the procurement of motor vehicles from Geographic Code 000 (U.S. only) to Geographic Code 935 (Special Free World).

A.	Cooperating Country	:	Togo
B.	Authorizing Document	:	Project Paper
C.	Project	:	Togo Animal Traction Development (693-0218)
D.	Nature of Funding	:	Grant
E.	Description of Goods	:	Four Station Wagons and six light-weight Pick-up Trucks; 26 Motorcycles, and spare parts
F.	Approximate Value	:	$175,000
G.	Probable Source	:	Togo
H.	Probable Origin	:	Japan or France

Discussion: Section 636 (i) of the Foreign Assistance Act of 1961, as amended, provides that none of the funds made available to carry out the Act shall be used to procure motor vehicles unless such motor vehicles are manufactured in the United States. However, when special circumstances exist, AID Handbook 1, Supplement B, Chapter 4, paragraph 4C2d, provides that the provisions of Section 636 (i) may be waived in order to carry out the provisions of the Act. Such circumstances include, inter alia, the inability of a U.S. manufacturer to provide a particular type of vehicle, and/or a present or projected lack of spare parts or adequate service facilities for U.S. manufactured vehicles.

The procurement of motor vehicles is critical to the success of this project. While the transport of draft animals from purchase point to farm delivery is assured by heavy trucks which are furnished under the contribution of the Government of Togo, light-weight pick-up trucks and station wagons are essential to accomodate the logistics of personnel, material and program supervision over a large project zone.

While the field extension program will be concentrated in the two northern regions, with a rudimentary infrastructure of roads and bridges, AID project assistance is also programmed into national animal traction activities which will range the length of the country, from Dapaon to the capital, Lome.

Station Wagons and pick-up trucks will be used by members of the AID project Technical Assistance Team and the project support staff. They will be employed to provide the following services:

a. Assure a regular liaison between T.A. assignment posts and the AID offices in Lome;

b. Assure regular and frequent visits of project technicians to supervise project field sites, and to observe parallel activities under the sponsorship of other donors;

c. Assure the transportation of light materials and equipment related to the animal traction program, as part of a regular system of project backstopping.

Vehicles are to be procured in two lots: half of the required number in year-one, and the other half in year three.

Motorcycles will be used by Peace Corps volonteers assigned to the project and will be used to:

a. Assure a liaison between remote field posts and central supply and direction points for both project-related and personal needs;

b. Assure a means to make regular and frequent visits to area field sites

c. Assure regular reporting of the needs of farmer-adopters in order to provide requisite backstopping.

Justification: No American automobile manufacturers are represented in Togo. Consequently, no service facilities are available to provide warranty servicing, maintenance and spare parts to support American manufactured vehicles. It would seriously impede the accomplishment of project objectives if American vehicles are purchased in the absence of such service and supply facilities. Japanese and European vehicles, on the other hand, are being used in great numbers and maintenance is not a major problem throughout the country.

The OAR/Lome is currently using several vehicles of European manufacture in the implementation of country project activities, and has found service and maintenance to give complete satisfaction.

No motorcycles of the type desired are manufactured in the United States. The most likely origin of motorcycles for this project is Japan. Honda and Yamaha units are readily available in-country and can be easily maintained by licensed company representatives.

The PeaCE Corps in Togo has used motorcycles of the sort described above, over the past four years and can attest to their practicality in every respect.

Recommendation: For the above reasons, it is recommended that:

(1) special circumstances exist which merit a waiver of the provisions of Section 636 (i) of the Foreign Assistance Act;

(2) approval be given of a source/origin waiver from AID Geographic Code 000 to Geographic Code 935 for the purchase of four station wagons and six light-weight pick-up trucks, twenty-six motorcycles and requisite replacement parts;

(3) certification be given that exclusion of procurement from Free World countries other than the cooperating country, and countries included in AID Geographic Code 935, would seriously impede the attainment of U.S. foreign policy objectives and the objectives of the foreign assistance program.

Approved : _____

Disapproved : _____

Date : _____

ACTION MEMORANDUM FOR THE ASSISTANT ADMINISTRATOR FOR AFRICA

FROM : AFR/DR, Norman Cohen

SUBJECT: Togo Animal Traction Development Project (693-0218)

Request for Source/Origin Waiver for Shelf-item Procurement

Problem: Your approval is required to authorize a Source/Origin Waiver from Geographic Code 941 to Code 935, for the purchase of various commodities offshelf for project related activities.

A. Cooperating Country : Togo

B. Authorizing Document : Project Paper

C. Project : Togo Animal Traction Development (693-0218)

D. Description of Goods : Gasoline and other Petroleum products, selected Office and Residential furniture and equipment, Bicycles and Motorbikes (and their spare parts), Kerosene and Electric Refrigerators, Gasoline and Manual Water Pumps, minor Farm and Livestock supplies and equipment, and various miscellaneous items.

E. Nature of Funding : Grant

F. Approximate Value : $400,000

G. Probable Source : Togo, Ivory Coast, Benin and Nigeria

H. Probable Origin : Geographic Code 935 Countries

Discussion: Approximately $2,466,000 of AID funds is programmed for local currency expenditures under this project. This sum is equal to about 49% of the total life-of-project costs of $4,990,000. Of these local currency expenditures, approximately $400,000 has been budgeted for commodities available in Togo (shelf-items) having their source/origin in Code 935 countries. The rest of the local procurement is scheduled for goods and services of local (Togo) source/origin (such as draft cattle, farm implements, and some local salaries) for which no waiver is required.

The shelf item procurement rules (AID Handbook 1, Supplement B, Section 18A4b) limit the purchase of shelf items which have their origin in Code 935 countries to 10% of the total local costs financed by AID for the project.

Moreover, AID Handbook 1, Supplement B, Section 18A4b states, "in no case may the total amount of such purchases exceed $250,000 without first obtaining a Geographic Code source waiver."

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With $2,466,000 designated as local currency costs in this project, the limit for the purchase of shelf items having their origin in Code 935 countries would therefore be $246,000. In the absence of a source waiver, the limit for the purchase of shelf items having their origin in Code 935 countries would be $250,000. Consequently, a source/origin waiver of the $250,000 limit is requested in order that $400,000 worth of commodities imported into Togo for resale that originated in Code 935 countries may be purchased.

The requested waiver will allow for the purchase of gasoline and other petroleum products, selected office and residential furniture and equipment, bicycles and motorbikes (and their spare parts), kerosene and electric refrigerators, gasoline and manual water pumps, minor farm and veterinary supplies, and various miscellaneous items, all of which are available off shelf within Togo and neighboring states, but do not have their origin in Geographic Code 941 countries.

The eligi bility of these items will enable the Project Management Unit, comprised of the AID project officer and the technical assistance team to obtain the aforementioned items when needed. It will permit the procurement to be undertaken in a timely fashion which will greatly assist in project implementation, particularly in the initial phase of the project. Since these items contribute towards the attainment of project goals and purpose, the prompt scheduling of the procurement of these items becomes critical for the successful implementation of the project.

Recommendation: Based on the justification set forth above, it is recommended thet you (1) approve this request for a Source/Origin waiver to allow the procurement of up to $400,000 worth of shelf item commodities having their origin in Geographic Code 935 countries, and (2) certify that exclusion of the procurement from free world countries other than the cooperating country and countries included in Code 941 would seriously impede attainment of U.S. foreign policy objectives and objectives of the Foreign Assistance Program.

Approved: _____

Disapproved: _____

Date:

1X

Abbreviations and Acronyms

AID	Agency for International Development
AIP	Accelerated Impact Program
ANTRAC	Animal Traction
ARCOMA	Atelier Regional de Construction de Materiel Agricole
BCEOM	Bureau Consultatif des Etudes Outre-Mer
BDPA	Bureau de Developpement et de la Production Agricole
BEPC	Brevet d'Etudes de Premiere Cycle
BEPCM	Brevet d'Etudes de Premiere Cycle -
CAA	Centre d'Apprentissage Agricole
CAT	Centre d'Appui Technique
CEFEB	Centre d'Etudes Financieres et Banquaires
CESAO	Centre des Etudes Socio-Economique de l'Afrique de l'ouest
CFA	West and Central African Franc
CIERO	Centre Inter-Etats de Radio de Ouagadougou
CNCA	Caisse Nationale de Credit Agricole
CNPPME	Centre National de Promotion des Petites et Moyennes Enterprises
COCA	Comite d'Etude et d'Orientation du Programme de Culture Attelee
CONAUDEC	Comite National pour le Developpement des Unions Cooperatives d'Epargne et de Credit
CUNA	Credit Union National Association
DRDR	Direction Regionale de Developpement Rural
DVSA	Direction des Services Veterinaires et de la Sante Animale
EA	Environmental Assessment
ENA	Ecole Nationale d'Agriculture
EORD	Eastern - Organization Rurale de Developpement
FAC	Fonds d'Aide et de Cooperation
FAO	Food and Agriculture Organization

FED	Fonds Europeen de Developpement (European Development Fund)
FED-V	Fifth funding cycle of EDF (European Development Fund)
FM/BFD	Financial Management/Banking and Finance Division
FSI	Foreign Service Institute
FSN	Foreign Service National
GOT	Government of Togo
GSA	General Services Administartion
GTZ	German (Federal Republic of) Development Assistance Program
IBRD	International Bank for Reconstruction and Development
ICRISAT	International Crop Research in Semi-Arid Tropics
IEE	Initial Environmental Examination
IEED	International Institute for Environment and Development
IFCC	Institut Francais de Cafe et de Cacao
IMF	International Monetary Fund
IMPHOS	Institut Mondial de Phosphate
INADEZ	Institut Africain d'Etudes Economiques et Sociales
INFA	Institut National de Formation Agricole
IRAT	Institit de Recherche Agronomique Tropicale
IRCT	Institut de Recherche Cotonniere et des Textiles
IRR	Internal Rate of Return
IRT	Improved Rural Technology
JAO	Joint Administrative Office
LD	Lethal Dose
M&E	Monitoring and Evaluation
MDR	Ministere de Developpement Rural
MT	metric tons
NASA	National Aeronautique and Space Administration
OAR/Lome	Office of the AID Representative, Lome, Togo

OAU	Organisation Africaine d'Unite
ODEF	Office des Eaux et Forets
OPTA	Office de la Promotion de la Traction Animale
ORSTOM	Office de la Recherche Scientifique et Technique Outre-Mer
OTP	Office Togolaise des Phosphates
OTTA	Organisme Togolaise de la Traction Animale
PACD	Project Activity Completion Date
PC	Peace Corps
PCV	Peace Corps Volunteer
PID	Project Identification Document
PIO/C	Project Implementation Orders/Commodities
PIO/T	Project Implementation Orders/Technical Assistance
PL-480	Public Law 480
POL	Petroleum, Oil and Lubricants
POV	Privately Owned Vehicle
PP	Project Paper
PRODEBO	Promotion et Developpement d'Elevage Bovine
PROPTA	Projet de Promotion de la Traction Animale
PSA	Procurement Services Agent
PSC	Personal Services Contract
PVO	Private and Voluntary Organizations
REDSO/WA	Regional Economic Development Service Office/West Africa
RLDC	Relatively Lesser Developed Countries
RPAP	Rebuttable Presumption Against Registration
SAFGRAD	Semi-Arid Food Grain Research and Development
SEDES	Societe d'Etudes pour le Developpement Economique et Social
SODOPRODER	Societe Togolaise pour la Promotion de Developpement Rural
SOTED	Societe Togolaise d'Etudes au Developpement

SOTEXMA	Societe Togolaise d'Exploitation de Materiel Agricole
SOTOCO	Societe Togolaise du Coton
SORAD	Societe Regionale d'Amenagement et de Developpement
SPSS	Small Program Strategy Statement
S&T	Science and Technology
ST/AGR	Science and Technology/Agriculture
ST/FNR	Science and Technology/Forestry and Natural Resources
TAT	Togo Animal Traction
UNEP	United Nations Environmental Program
UNDP	United Nations Development Program
UNIDO	United Nations Industrial Development Organization
UPROMA	Unite de Production de Materiel Agricole

II. PROJECT DESCRIPTION

INTRODUCTION

This Project Paper presents the U.S. response to the request of the Togolese Government to support its major rural development initative in concert with anticipated funding by other donors. A total of $ 4,990,000 in grant assistance is planned over a period of 5 1/2 years from the late 1982 to early 1988. The categories of assistance will include a) institution building, b) training, c) development of extension activities, d) supply of animal traction units and directly related support services, and e) technical advisory services.

BACKGROUND

During the 1970's, Togolese agricultural policy was dominated by the conviction that real improvement in agriculture was only possible through motorized mechanization and the commercialization of production. A great deal of political energy and economic resources were expended in this pursuit. By the late 1970's, it was increasingly apparent that tractors did not respond to the needs of smallholder agriculture in Togo. The GOT, openly acknowledging this, has since launched a major public initiative to introduce, expand and support the use of animal traction technology by smallholder farmers.

Parallel to the experience with tractors, a number of much more modest attempts were being made to introduce animal traction during the 1970's. U.S. involvement in animal traction in Togo began in 1971 when the Kara regional rural development organization (SORAD then, DRDR now), some Peace Corps volunteers and the U.S.Ambassador's Self-Help Fund began a pilot program to introduce animal traction to smallholders. By 1979, some 30 units of oxen and equipment had been sold on credit. Togo Animal Traction, an AIP, was funded in 1978 and began implementation in 1979. This activity involved 4 villages staffed with Peace Corps Volunteers, and the building of a logistics and training center at Agbassa. By 1982, some 90 animal traction units have been distributed on credit.

This continuous, though modest, U.S. involvement has earned a certain credibiltity in the thinking of the GOT and of other projects for U.S. assistance to agriculture and to the expansion of animal traction in particular. The recent strong GOT rural development initiative in support of animal traction has prompted the design and implementation of a great number of donor-assisted animal traction projects. With so much activity,

so many different donors, and so many different project strategies, the GOT has recognized an increasing need for the standardization and coordination of animal traction policy and strategies.

GOAL, PURPOSE AND OBJECTIVES

1. Project Goal

The goal of the AID Togo Animal Traction Development Project (TAT) is to increase the agricultural production and incomes of Togolese smallholder farmers.

2. Project Purpose

The purpose of TAT is to restructure, coordinate and harmonize animal traction extension in Togo through:
a) strengthening the newly created National Animal Traction Program (PROPTA) and its ability to delive. services in the areas of animal supply, training, credit and monitoring, and evaluation.
b) the creation of Extension Support Centers (CAT's) in the two northern regions of Kara and Savanes to work with farmers and agro-pastoralists in animal traction.

3. Project Objectives

The objectives of TAT are to:

a) develop a national system for the acquisition and delivery of work animals,

b) develop training courses in animal traction for field staff and administer those courses to TAT extension staff,

c) develop methodologies for monitoring and evaluating animal traction projects and carry them out for the TAT project,

d) standardize and coordinate the administration of medium-term animal traction credit programs with the National Agricultural Credit Bank (CNCA),

e) establish 10 Extension Support Centers and train their staff,

f) introduce 500 farmers to the use of animal traction,

g) create two pilot herds to study possibilities for the improvement of extensive livestock production practices,

h) conduct a program of applied research on cropping packages and farming systems using animal traction.

PROJECT INPUTS AND OUTPUTS

This project will work at a number of levels towards a range of objectives. This means that different activities will be operative at different levels (national, regional, local) and at different times. For this reason, the design team feels it is necessary to conceptualize the project's life in phases which reflect the combination and coordination of the various project activities. This is also why the PP calls for 5 1/2 years instead of 5 years as stated in the PID. If the project were to terminate in the fall of 1987, and the technical advisors were to leave at this time, the results of the last cropping season (harvest is in December) would not be available for interpretation and analysis. This would effectively reduce the project to a four year life.

1982 - 83: Interim Phase (PY 1)

There are essentially three reasons for this phase. Given the administrative requirements of contracting, it is unlikely that the technical assistance team will arrive much before August, 1983. The construction program (animal buying center, extension support centers, office block) will not be completed much before August, 1983. The National Animal Traction Program (PROPTA) is about to be created, but likely will not be operative until sometime in 1983. Consequently, the first year of the project will be an interim period between the AIP and the arrival of the technical assistance team. An Interim Project Coordinator will be responsible for monitoring the construction program, continuing and expanding the program which was begun under the AIP activity, and for initiating commodity procurement.

1983 - 1985: Second Phase (PY 2, PY 3)

The full technical assistance team will arrive at the end of project year one. The construction program and commodity procurement should be largely completed. The technical advisors will develop programs of work for various project activities and initiate them. By the end of this phase, preliminary results will be forthcoming. Any redesign of project activities should occur by the end of this phase.

1985 - 1988: Third Phase (PY 4, PY 5, PY 5 1/2)

All project activities will be fully functional. Efforts should

begin in order to shift responsibility, support and maintenance progressively to the GOT.

This above brief presentation of phasing project activities permits project infrastructure to be installed before technical advisors arrive. It explicitly recognizes the eventual possibility of redesigning certain project activities. It allows for the transition to full GOT management and support, and provides for the full benefit of the last year of project life.

PROJECT INPUTS

The major areas of AID inputs are Technical Assistance, Commodity Procurement, Construction, and Operating Costs. Particular to the project is an allocation to establish a series of revolving funds (see detailed budgets in Annexes Two and Ten).

Under Technical Assistance, 14 person-years of long-term assistance and 11 person-months of short-term assistance are funded. There are also 5 person-months funded as part of the planned external evaluations. Total technical Assistance is $ 1.966,170.

Under Commodity Procurement, 4-wheeled vehicles have been funded for the Technical Assistance and 2-wheeled vehicles for the extension staff. Equipment will be procured for the animal buying center and the extension support centers. The PROPTA Training and Monitoring and Evaluation Units are also being funded for specialized equipment. Office equipment is being procured for all offices directly related to TAT activities. The total Commodity Procurement budget item is $ 400,445.

The Construction Program includes a central office block for TAT in Kara, the GOT's project director's residence, additional housing at the Agbassa Center, the entire animal buying center installations at Tantiegou and the construction of 10 Extension Support Centers. Costs for water wells at the centers have been set aside, although it is hoped that either the AID bilateral Rural Water Supply Project or other donors might contribute towards drilling and equiping the wells. The total Construction Program Budget item is $ 412,550.

The Operating Cost budget covers vehicle functioning costs and office operations. There are also funds set aside for those training programs administered in the two northers regions under TAT. Total Operating Costs budgeted are $ 381,340.

There are three Revolving Funds to be financed by the project. The two separate accounts for animal purchase and equipment purchse will permit the two northern DRDR's to make animal traction units available to

TAT farmers on credit. The veterinary revolving fund has two purposes. It will permit the DRDR's to guarantee the supply of veterinary products to TAT farmers. It will also permit PROPTA to create two pilot herds which, through natural herd turnover, will be financially self-sufficient. The Revolving Funds amount to $ 575,000.

Finally, a contingency factor of 10% of project costs has been included and amounts to $ 373,535. [illegible] of 12% has been used for inflation and amounts to $ 881,694. The total USAID budget contribution is $ 4,990,000.

GOT CONTRIBUTIONS

A total GOT contribution to AID-TAT activities of $ 1,670,000 consists mostly of personnel costs ($526,152) and operating costs ($ 283,570). A number of vehicles will be provided by the GOT ($ 200,250) as well as some construction costs ($ 100,000). The same factor applied to the AID funds have been used for contingency allowances ($ 111,015) and inflation ($ 448,054).

OTHER CONTRIBUTIONS

Direct participation in TAT is also provided by Peace Corps. Each of the Extension Support Centers will benefit from technical resources and coordination support supplied by a trained Peace Corps Volunteer. The animal buying center will be staffed with a volunteer. A construction volunteer will be assigned to the project to oversee the smaller construction sites. Finally, three volunteers will be assigned to coordinate animal traction training programs at three centers: Tantiegou, Agbassa and Kamina.

PROJECT OUTPUTS

The Log Frame and Technical Annexes discuss project outputs and inputs as well, in much more detail. Here they are presented in summary form.

1. The national animal buying system will be established with working procedures for animal health care and mantenance. The national buying center (Tantiegou) will have the capacity to handle 2000 animals per year. A buying out-center will be established at Agbassa.

2. The PROPTA Monitoring and Evaluation Unit will have the capacity to collect, analyze and interpret farm and project level data on the economic and financial impacts of animal traction.

3. The PROPTA Training Unit will have the capacity to produce training modules on a variety of topics in animal traction.

4. PROPTA headquarters for the north will be established and coordinate animal and equipment needs with other projects.

5. PROPTA pilot herds will begin to generate preliminary indications for improvements in livestock management using extension grazing techniques.

6. Procedures for running the Revolving Funds with the DRDR's, CNCA and the Veterinary Service will be established and operative.

7. The 10 Extension Support Centers will be established and supply support and technical services to animal traction farmers. They will also be carrying on demonstrations of animal traction techniques and doing some limited adaptive field testing of alternative cropping systems and alternative cropping operations.

8. The animal insurance and health care program will be established. All farmers introduced to animal traction (500) through TAT will be participating.

9. The CNCA will have developed the capacity to monitor animal traction loan portfolios. The procedures for repayment, default and foreclosure will be adhered to by all TAT farmers.

PROJECT FUNDING SUMMARY

($000)

	AID Total	AID US	AID LC	GOT	TOTAL
TA:					
Long-term	1,778	1,568	210		1,778
Short-term	116	106	10		116
Evaluation	72	50	22		72
LOCAL PERSONNEL:				526	526
COMMODITIES:					
Vehicles	164	-	164	190	354
Animal/Farm	35	13	22		35
Veterinary	17	4	13		17
Training	50	15	35		50
Survey	50	15	35		50
Office/Furniture	84	54	30	5	89
Construction materials				100	100
CONSTRUCTION:					
Kara	91	-	91		91
Agbassa	7	-	7		7
Tantiegou	64	-	64		64
CATs	180	-	180		180
Wells	70	-	70		70
REVOLVING FUNDS:					
Animals	300	-	300		300
Equipment	250	-	250		250
Veterinary	25	-	25		25
OPERATING COSTS:	382	65	317	275	657
TOTAL	3,735	1,890	1,845	1,096	4,831
CONTINGENCIES	374	189	185	110	484
INFLATION	881	445	436	464	1,345
TOTAL	4,990	2,524	2,466	1,670	6,660

AID BUDGET SUMMARY

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	YR 1	YR 2	YR 3	YR 4	YR 5	1/2 YR 6
TECHNICAL ASSISTANCE						
Contractor	87,980	519,920	519,920	259,960	259,960	129,980
Short Term		25,000	12,500	45,500	33,000	
Evaluations			40,000		32,000	
COMMODITIES						
Vehicles	81,875		81,875			
Animal/Farm Equipment	25,000	10,000				
Veterinary Equipment	10,000		7,000			
Training Equipment		25,000	15,000	10,000		
Survey Equipment		30,000	20,000			
Office Equipment & Furn.	61,135		23,560			
CONSTRUCTION						
Kara	91,250					
Agbassa	7,400					
Tantiegou	63,900					
CATs	180,000					
Wells	70,000					
REVOLVING FUNDS						
Animals	225,000	75,000				
Equipment	125,000	125,000				
Veterinary	25,000					
OPERATING COSTS	100,990	62,300	62,300	62,300	62,300	31,150
	1,154,530	872,220	782,155	377,760	387,260	161,130
CONTINGENCY (10%)	115,453	87,222	78,215	37,776	38,726	16,113
	1,269,983	959,442	860,370	415,536	425,986	177,243
INFLATION (12%)	1,269,983	1,074,574	1,079,248	583,798	670,297	312,362
TOTAL AID CONTRIBUTION	4,990,263					

III. PROJECT SPECIFIC ANALYSES

A. Summary of Economic Analysis

INTRODUCTION

Full discussion of the economic analysis can be found in Annex Two. Only summary statements will be presented here. Perhaps the most important characteristic of TAT as it influences the economic analysis is its multi-faced objectives. TAT will be strengthening GOT institutions (PROPTA, CNCA, DRDR's), training field staff (extension agents, veterinary agents, loan officers) and improving agricultural production (500 animal traction farmers). It will also be operating these varied activities at the local, regional and national levels. Conducting an economic analysis for the project's entire range of investments and activities becomes methodologially extremely problematic. The most serious problem is identifying benefit streams and quantifying them. For instance, draft animals will be purchased and delivered to other projects by TAT. These other projects, in turn, will supply them to farmer-adopters. Of the benefits generated by the use of those animals, how much can be attributed to TAT investments? Or similiarly, if TAT trains a veterinary agent in animal traction technology, how much of his productivity is attributable to TAT, particularly when animal traction animals are only part of his responsibility, and how do you quantify it? The design team has decided to separate out AID and GOT costs directly attributable to the extension support activity which is assumed to have a direct impact on agricultural production.

ASSUMPTIONS

In both the farm-level financial and project-level economic analysis, a series of basic assumptions were necessary. They reflect positions taken by the design team and the current economic and political climate in Togo. These assumptions are discussed in detail in Annex Two.

One macro-economic assumption which influences many factors in the analysis concerns the comparative rural-urban terms of trade. Subsequent to the negotiations for rescheduling the support loan, both the GOT and the IMF have adopted a policy to shift investment priorities out of the industrial and commercial sectors and into the agricultural sector. The design team feels that such a policy shift of investment priorities will favor improvements in rural-urban terms of trade on the side of the rural agricultural sector. It also provides some justification for supporting indirect input price subsidies to agriculture (in particular, interest rates).

Another major assumption which reflects positions taken by the design team, concerns the whole area of input price subsidies. The design team makes a clear distinction between direct and indirect input price subsidies. A national goal, and the goal of this project, is to improve agricultural production and incomes. Part of the strategy will involve technical innovations to farm operations. These innovations must not only be technically sound but also economically rational. In somewhat simplistic reasoning, if these innovations are economically rational, then there should be no need for input price subsidies. One other part of the strategy to improve agricultural production is to improve the operator's farm management capacity. A farm manager makes his decision on the basis of his resource constraints, market conditions and prices. A subsidized input price awards an artificially high productivity to that factor of production and distracts the farm-level decision making process. At the true cost of the input, his decision to adopt the innovation might not be the same. It has been the position of the design team not to use any input price subsidies either in the financial or economic analysis. In project implementation, TAT will compile evidence and present arguments to progressively reduce input price subsidies and eventually to remove them altogether.

One final assumption which directly influences the analysis, concerns the expected level of benefit flows from the use of animal traction. The history of animal traction projects in West Africa repeatedly points out that design documents seriously overestimate the expected benefits from animal traction. This results in overequipping farmers, high levels of indebteness, low levels of credit repayment and underutilized equipment (see Sargent et al). Throughout this design, the team has consistently used low levels of area and yield improvements and high levels of cost items. The intention is to use a conservative methodology such that the results of the analysis remain realistic.

ANALYSIS RESULTS

The farmer-level financial analysis demonstrates that adoption of animal traction will be advantageous, though not immediately. The combination of higher start-up costs (compared to later years) and the lag in productivity improvements and the leavening function, imply that in the first year or two, farmers may do slightly worse than without animal traction. Over 5 years, farmers' net benefits from the use of animal traction grow at about 7% per year. In year five, net farmer income is about 80% higher, on the average, than net income in year zero without animal traction. It is to be mentioned that this analysis was done without input price subsidies.

The project-level analysis shows a 10% Internal Rate of Return over 15 years. The adoption of conservative benefit and cost input data means that this IRR will tend to be on the conservative side. It is

also modest because further increases in areas and yields were discontinued after year five. Finally, inflation was not factored into the discounted measures of project worth. It is argued that, on the one hand, inflation is equally attributable to costs as to benefits and on the other hand, given the nature of the cost and benefit streams, inflation would inordinately favor the benefit stream.

The general conclusion of the economic and financial analyses is that the proposed AID investments will promote improvements in agricultural production and incomes. There are sufficient financial incentives for full-time farmers to adopt animal traction technology. Project investment costs will generate a benefit stream sufficient to justify approval of the requested funds. The design team has consciously attempted not to overstate the case for animal traction. There still remains a great deal of work to be done - clearly develop and specify rational farming systems using animal traction. Despite the modest expectations, the results of the analyses indicate that such a development activity deserves AID and GOT support.

B. Technical Analysis

Introduction

The analysis of the technical issues of animal traction must begin with a general principle -- animal traction is a means to increasing production, not a production end in itself. As an input, it interacts with the other elements of an area's farming system. Also, since it is not a single indivisible input such as seed, but a complex of elements with many feedback loops to other inputs, to the off-farming environment and to institutions, animal traction represents a larger perturbation of normal hoe farming practice, as well as a very sizeable debt burden on farm family income. While the nature of the perturbation can be very beneficial in terms of increased production, it can also result in confusion and loss of production and income at the farm level. Whether the net result of the introduction of draft power to the farm is positive or negative depends on how well and how quickly the farmer gains control of the technology, so that major power constraints can be overcome and improved management decisions made.

The experience of many other West African animal traction efforts has been that the learning curve for animal traction is shallow. It takes a long time for farmers to achieve mastery of the technology. Effects on surface area expansion and yields are small over a five year period, while the major increase in near-term income are due to appreciation in the value of draft animals for eventual sale as beef.

One of the key limiting factors to the success of animal traction in West Africa has been the failure to gain widespread acceptance of the elements designed to carry out weeding.

Acceptance and skill development with these implements can lead rather rapidly to a restructuring of farm operations to permit early sowing and timely weeding. These two effects alone permit better occupation of the full growing period, greater likelihood of success with relay or double crops, and greater water availability during early crop establishment.

In addition to these yield influencing effects, adoption of mechanical weeding permits surface area expansion up to about 60% beyond the level set by available hand labor for the average family. However, the weeding tools are not usually adopted on a wide scale. There seems to be a number of reasons why this is so. Equipment may not be well-designed for local conditions. Extension emphasis on this operation may be low because the agents have poor skills with the equipment. Farmers may receive a high risk factor associated with draft animals and equipment working in an established crop. Finally, there may be economic and social opportunity costs in replacing the hand hoe with the draft technology which are perceived to be greater than the potential benefits of adoption.

The TAT project intends to address head on this critical stumbling block to animal tration success at the farm level. It will concentrate early training of extension officers and middle management on weeding. In turn, project technical assistance will place special emphasis on demonstration and training farmers in weeding techniques.

However, the project cannot neglect the factors which will enable the extension effort to be successful. Land must be available in sufficient quantities for animal traction to work. Draft stock of appropriate conformation, size and health must be available in sufficient numbers. Once animals are on the farm, proper husbandry must be exercised and professional veterinary services obtained to ensure animal survival and ability to work. Equipment must be available in good working order for the growing season. Cropping practices must be modified to make the best use of the available power. Medium-term credit must be obtainable at interest rates and repayment scheduling which can be met from farmer incomes.

The following sections discuss and summarize these themes which are developed in greater detail in Annex Three.

Land Issues

In principle, animal traction should enable rapid extension of cropped surface area. Where demographic pressure is high or land capability is low, a key feasibility issue is whether or not there is sufficient land available for expansion.

Data on land occupation, and hence availability, are poor for northern Togo. Recent studies have not provided even a good qualitative ranking of occupation rates in the two northern regions. However, the design team has sited extension activities to coincide with large farm size and large within-farm parcel size. Since the history of animal traction in West Africa generally, and Togo specifically, indicates slow adoption of the mechanization of weeding -- the operation most limiting current farm size -- only modest surface area expansion (about 30 percent) is expected over the first five and one-half years of the project. Assuming 250 farmers with three hectare farms in the Kara region and 250 farmers with 4 hectares in the Savanes region, an increase in cultivated surface area of 525 hectares may be expected at most. The figure will be dwarfed by projects which specify large-scale land clearing for production and resettlement purposes, or whose rural infrastructure and water supply activities will open up new land for cultivation.

This TAT project will, however, seek to reduce the weeding constraint and has specified close monitoring of farm level data to permit an assessment of the rate of land expansion, should it occur. Due to the presence

of many fragile soils in the project area, the project will incorporate minimum tillage in its technical extension packets.

Livestock Issues

Without animals of proper conformation, size and health, there could be no animal traction project. Current animal use is based on the purchase, breaking and training of male animals in the 2.5 to 3.5 age class. Examination of herd growth rates and structure shows that the limit to exploitation of this age class is reached when about 15,500 animals are in the traction herd. At this point, total permitted annual offtake will just meet replacement needs. The projected date for this occurence is about 1990/91. However, since meat demand is very strong and growing, Togo cannot depend on importation of cattle to permit expansion of the national animal herd for traction purposes. Even before this point is reached, meat demand and/or price increases may deny the animal traction project's access to the cattle marketplace or reduce the size of available animals to unacceptable levels.

The only realistic short-term solution to this problem is the use of cows as traction units. This option entails rearranging breeding cycles, even more intensive efforts at resolving dry season feed and water supply questions, and more vigilant health care than in the case of males. In the long-run, herd growth rates and herd structure must improve if both meat and traction needs are to be satisfied.

In the near-term the project will create a national buying organization to ensure a strong presence on the market place. The buying structures at Tantiegou and Agbassa will handle about 2,000 animals a year. A health card and insurance system will be set up to ensure that animals, once purchased, survive to work and that animals can be replaced in the event of death by accident.

For the medium-term and long-term the project will establish two pilot herds to study ways of improving extensive herd management, structure and growth rates.

The project, PROPTA, and the DRDRs will cooperate with both Public Health and Public Sanitation services to reduce the possibility that transmission of zoonotic diseases occurs between animals and humans.

Equipment Issues

The major equipment issues are supply, repair and maintenance, and choice of equipment package. UPROMA is supposed to furnish national equipment needs and can do so if prefinancing of raw material purchase is available. Both UPROMA and Project North Togo will offer blacksmith training. A network of material supply and blacksmiths should be developed through them. Maintenance should be taught to farmers.

The current equipment packages vary considerably, but always seem to have one (cart) or more (cart and harrow) items which are expensive but

little used by farmers. The situation must change to allow custom-building of packages to individual needs and repayment ability.

Crop Issues

The project area has been divided into two zones, a root crop zone south of Gando and a cereals crop zone north of Gando. The former zone is wetter, with yams being a dominant food crop. The latter zone is drier, with larger farm sizes, larger cereal fields and a lack of root crops, except some cassava, due to dry season predation by domestic stock and wildlife fauna of leaves and roots. Within these zones, minimum farm size criteria have been established for animal traction extension. In the Kara region, the lower limit is three hectares. In the Savanes region it is four. The cutoff points were established on the basis of economic calculations and an assessment of the technical practicality of introducing draft power.

While the increase in available power opens the possibility for better use of rainfall, the growing season, land and labor, it must be admitted that a realization of the potential requires radical restructuring of farm management practices and time for skills development. Also, the fragility of many soils argues for an extension of reduced tillage technologies, cropping practices and rotations which maintain soil cover and fertility, forage crop rotations to extend dry season grazing and improve fallow pasture grazing, and trials of an agroforestry system to address fuel, fertility and forage needs over the long term.

While mixed farming holds many potential advantages, it is not a closed system. Nutrients are exported annually in crops and, at least every five years, as meat. Animal manure production does not come close to meeting soil fertility needs. The project will build upon current research to test the best ways of introducing rock phosphate and sulfur in extension programs.

Adaptive Field Testing

Animal traction is not new in West Africa. Both francophone and anglophone area research have produced numerous technical packages. A major contributing flaw in past projects has been the failure to adapt packages to local conditions. For the TAT project, local conditions mean that the farmer has complete control over the practice or methodology being tried. This should enable the farmer to gain the management skills and confidence needed to make the productivity and area expansion objectives available.

The monitoring and evaluation unit of PROPTA will play a key role in assuring careful reporting and analysis of these field experiences.

C. Social Soundness Analysis

Table 1 shows population change and population density from 1960 to 1981 (based on provisional census results) of the project zone, broken down by circumscription and prefecture. It is clear that both the Kara and Savanes regions grew rapidly in population, and that there is considerable variation among prefectures in the rate of population growth. Over the last decade, the average rate of population increase in the Kara region slowed somewhat, from 2.3 to 1.8 percent but the average rate of population growth in the Savanes region increased noticeably, from about 2.8 percent per year to 3.2 percent per year. Both changes are probably more due to changes in regional migration rather than major changes in birth and death rates.

The density of settlement is important for animal traction projects, because much of the early increase in farm production in most contexts in West Africa that is attributable to such projects is usually due to increases in cultivated area, and the success of such projects depends in part on the availability of uncultivated land. Although the density figures in the table are rough (they include both urban and rural populations and they do not allow for both wildlife and forest reserves in which settlement is forbidden), they show that population density varies greatly between prefectures, and suggest that, other factors being equal, Keran, Doufelgou, Bassar, Tone and Oti prefectures might be more promising zones in which to concentrate project resources than Binah and Kozah.

Table 2 shows the ethnic diversity of the project zone, and Figure 1 shows the approximate distribution of ethnic groups at about 1960. The ethnographic data on the diverse groups in the project region vary greatly in age and in quality. Various funded (including AID sources) and conducted studies of these groups have not yielded useful results on the sociological impact of agricultural projects. Although the GOT and several donor organizations have tried to establish pre-cooperatives based on traditional social structures, able to invest in agricultural equipment and manage it, general experience of the Togo Animal Traction AIP with cooperative ownership has not been good, and it seems preferable that the project try, where possible, to give credit and equipment to single families rather than cooperatives.

The information collected in the next agricultural census could be much more useful than in the last one if it were more completely exploited and analyzed. Statistique Agricole tabulated the last census by hand (although there was supposed to be provision for use of computers); use of machines with SPSS[1] could give a large number of multiway tabulations with more detailed categories (e.g. prefecture rather than region). If the monitoring and evaluation unit uses the

[1] SPSS: Statistical Package for the Social Sciences.

agricultural census as the basis for its own work, it might be valuable to verify that the questionnaire actually inventories fields belonging to or cultivated by all members of the household, since the last agricultural census arrived at very small total cultivated areas in some regions, and since the linguistic intricacies of field categories may mean that surveyors are omitting to ask for some kinds of fields.

The relationship among variables such as access to land, household income, family size, and propensity to adopt animal traction equipment (observed in southern Mali and eastern Upper Volta) could make it difficult to disentangle the causes and the effects of use of animal traction. For example, in the Eastern ORD, women in animal traction households work fewer hours per day than women in other households. But most of the difference can probably be attributed to the larger size of animal traction households and to economies of scale in domestic work.

Discussion of the division of labor among members of family farms in northern Togo shows that it varies from one ethnic group to another, that there have been many recent changes in all housholds, and that use of animal traction has not noticeably diminished the time most women reported devoting to artisanal work and commerce.

Although a strong case has been made that the entrustment system in Tenkodogo, Upper Volta had lower costs and higher returns than animal traction in which farmers kept animals on the farm year round, northern Togo differs from southern Upper Volta in several significant ways. Forage and water may be more available during the dry season than further north, cash cropping is more prevalent, and rainfall may be less uncertain. The sum of these differences may mean that the costs of animal traction are somewhat lower, and the benefits (chiefly by allowing farmers to prepare land for cash cropping during the early weeding of grain crops) somewhat higher. However, water is a problem for some farmers trying to keep cattle during the dry season, and it would be advisable to try to coordinate work with the AID-funded Togo Rural Water Supply Project and projects from other donors to try to locate wells in those zones where animals are being placed. Renting some pieces of equipment and teams has been profitable elsewhere, and the project might do well to encourage it, both as custom-work by farmers owning draft animals, and by renting out equipment (like the carts) that may be too expensive for farmers to purchase. It should be possible to set reasonable user fees by experimenting. Other innovations that make dry-season use of animals more profitable should also be encouraged where possible--for example, by making some technical trials on using oxen for dry-season irrigated gardening, and then trying to coordinate with the work of gardening projects. It has bee proposed that OAR/Lome design an ancillary

small-scale rural works project midway through TAT implementation, which could do a good deal to encourage use of animals for transport and dry season garden use.

We have seen that (as elsewhere) traditional cropping systems in northern Togo use labor-intensive methods of raising yields: ridging and mounding, construction of terraces, incorporation of manure and plant material into the soil and interplanting with nitrogen-fixing legumes (which gives an 'implicit rotation'). In general Peace Corps volunteers and extension personnel transferred in from outside the region do not have a detailed knowledge of traditional farming practices in the district in which they are working. Such knowledge should include the names of major cultivars, their relative yields, their growing period, and their relative resistence to drought, disease, insect, and other herbivore damage. Training in ethno-scientific methods would be very valuable for both PCVs and Togolese extension personnel, and could lead to developing notebooks and traditional cultivation practices (and on local experience with introduced practices) for each district. Such work could greatly improve communication among locally-recruited farm extension agents, farmers, and higher-level technical service personnel.

Traditional land tenure systems have within themselves the means for relocating uncultivated land and should pose no barrier to the expansion of cultivated area through use of animal traction. However, we have little current information on recent changes, and it may be the case that increasing population or the forced resettlement of some populations (for example, after the establishment of the Keran game reserve) has increased population pressure on the land in some places and changed current land-holding practices.

Table 1 A:

Resident Population of Project Zone 1960-1981 by Circumscription/ Prefecture

1970 Circumscriptions	1960 population	1970 population	% change 1960-70	1970 density/km2
Kara Region				
Kande	31,893	41,431	39.9	24.9
Lama Kara	87,543	99,215	13.3	92.3
Niamtougou	43,369	52,070	16.7	40.8
Pagouda	38,359	44,588	16.2	92.9
Central Region				
Bassari	72,953	95,475	30.9	15.6
Bafilo	21,147	29,445	39.2	-
Total	295,264	362,224	22.7	-
Savanes Region				
Dapaong	140,466	183,164	30.4	40.1
Mango	47,023	57,559	22.4	14.7
Total	187,489	240,723	28,4	-

Source: K. Zachariaj and N.K. Nair, Togo: External & Internal Migration in Demographic Aspects of Migration, Volume 2, World Bank Working Paper.

Table 1 B:

Resident Population of Project Zone, 1960-1981 by Circumscription/ Prefecture

1981 Prefectures	1981 population	% change 1970-81	1980 density/km2
Kara Region			
Keran	44,762	8.0	27.0
Kozah	120,878	21.8	112.44
Doufelgou	66,120	27.0	51.8
Binah	50,077	12.3	104.3
Bassar	118,345	23.9	19.4
Assoli	32,444	10.2	-
Total	432,626	19.4	-
Savanes Region			
Tone	249,079	36.0	54.5
Oti	77,747	35.1	19.9
Total	326,826	35.8	-

Source: Togo, Direction de la Statistique. Resultats provisoires du Recensement General de la Population et de l'Habitat (9-22 novembre 1981); Comparaison avec le Recensement General de la Population (1-30 avril 1970).

Table 2 Approximate Distribution of Population by Ethnic Group circa. 1972 (percent)

Regions	Savanes[1]		Kara[2]				Centrale		Total Project Zone
Ethnic Groups	Prefectures Tone (Dapaong)	Oti (Mango)	Kozah (Kara)	Binah (Pagouda)	Doufelgou (Niamtougou)	Keran (Kante)	Bassar[3] (Bassar)	Assoli[4] (Bafilo)	
Moba	40	15	-	-	-	-	-	-	14
Peul	5	2	1	1	1	1	-	-	2
Gourma	45	-	-	-	-	-	-	-	14
Mossi	3	-	-	-	-	-	-	-	1
Yenge	2	-	-	-	-	-	-	-	1
Tchokossi	-	38	-	-	-	-	-	-	4
Kabiye	-	2	96	84	0	0	10	-	25
Konkomba	-	2	-	-	-	-	26	-	4
Lamba	-	2	0	0	32	81	10	-	11
Boussansi	1	-	-	-	-	-	-	-	0.3
NgamNgan	-	28	-	-	-	-	-	-	3
Losso	-	-	3	0	27	0	10	-	5
Naoudemba	-	-	0	0	34	0	-	-	3
Tamberma	-	-	0	4	6	15	-	-	2
Solo	-	-	-	11	0	3	-	-	1
Bassari	-	-	-	-	-	-	30	-	5
Misc.	4	11	-	-	-	-	-	-	5
	100	100	100	100	100	100	100		100

Source: [1] SEDES. Monographie de la Region des Savanes (Version Provisoire) 1972.
[2] SEDES. Monographie de la Region de la Kara (Version Provisoire) 1972.
[3] SOTED/BCEOM/BDPA. Projet de Developpement Rural Integre des Regions de Bassar et de Mo. 1981.
[4] Information was not available on Assoli prefecture.

D. Institutional Analysis

Beyond (or perhaps through) the draft animals and equipment, the farm extension services, and the training and technical advisory services, this project intends to strengthen the institutional capacity of public structures and private individuals in Togo to make harmonious, efficient and rational decisions related to the introduction and support of an improved farming system, of which animal traction is a part. This strengthening function is to be exercised at three levels: national policy, local (regional) service programs, and the farmer-adopters in the project zone. The end result of efforts generated under this project (and supporting programs) is a development institution that has as its major purpose, contributing to sustained improvement in agricultural production and productivity, farm-family incomes and the rural quality of life of a broad socio-economic grouping of clientel. This project is designed to work through existing (or modified) organizational structures and with Togolese human resources to develop and render services which become part of an institution which is highly valued for the continuing improvement of its clientel.

The historical institutional development of animal traction in Togo provides a good background for an understanding of the process that AID will support under the project. Animal traction technology is not indigenous to Togolese traditional farming systems. It is an introduced technology which has had a spotty record of mostly failures during the twentieth century.

The earliest recorded use of animal traction in Togo is in 1903, when German colonizers engaged a team of technical assistants from Tuskeegee Institute in Alabama to help introduce improved cotton cultivation practices in the Plateaux Region of south-central Togo. Besides other problems encountered in transferring cotton growing technology from the southern United States to Togo, the animal traction component of the recommended technical package came to a quick and dismal end when all of the draft animals (bulls, found in more northern regions) succumbed to trypanosomiasis.

The experiment was tried again and again throughout the colonial history of Togo, never on a very large scale, rarely on a farm-level, and mostly in connection with attempts to put large tracts of land under cultivation of cotton. The efforts were dispersed geographically, rarely (if ever) included integrated support systems, and certainly received no encouragement from regional or national rural development structures. The most recent large-scale attempt before the last decade to use animal traction as a means of production was a seven year (1963-1970) project in the northern Savanes Region, funded under French assistance and implemented through the BDPA. Although approximately 700 pairs of bulls were distributed to farmer-adopters in the region, an evaluation of project outputs shows that almost nothing of the new farming system was institutionalized and very little evidence exists today in an operating condition that suggests that such an activity was ever promoted with area farmers.

Five Peace Corps volunteers were requested by the Kara Region rural development organization in 1971 to work with a few area farmers in introducing animal traction units. There was no clear idea of how equipment and animals were to be obtained, and most of the support systems were left up

to the imagination of an enterprising volunteer and a few interested Togolese farm extension agents. Even less attention was paid to any modifications in a farming system to which the tool of animal traction was being introduced. As long as a trickle of U.S. Self-Help Funds paid for animal and equipment purchases (which were then literally ceded to interested parties, for lack of a credit system), and as long as volunteers managed to run a crude blacksmith shop for equipment repairs and could serve as intermediaries for occasional veterinary interventions, the program managed to get along.

Some Kara Region missionaries pursued the same plucky pattern, independently sponsoring a score of animal traction units near Atchangbade, site of the present-day AID/FAC-funded (through the Entente Fund) Projet Vivrier.

At no point were either the scale of operations, the duration of the term of technical assistance, the monitoring and reporting procedures or the integration with government personnel and programs of a level that made more than a passing impression on farmer-users, on food production or on modifying farm system support planning within the public and private sectors. By the mid-1970's, animal traction, as a practical tool to assist in rational farm management decisions that could lead to greater food production, was non-existent. While several units were in place, the clients were effectively unaware of the real value of the animal traction tool to want to make the effort to institutionalize its development.

In 1974, the sudden rise in world phosphate prices, and the consequent windfall in receipts that accrued to the GOT treasury, pushed planners in Togo to recommend a rapid capitalization of the country's economy, particularly the industrial and touristic sectors.

Agriculture was "modernized" as well, with the creation of a parastatal, SOTEXMA, with upwards of 300 large motorized tractors. The tractor-hire service was 85 percent subsidized, and initial demand was so high that the subsidy was reduced to 50% in 1978. With increasing fuel and repair costs, and the literal impossibility of meeting field operations according to the farmers' wishes, the GOT could soon no longer afford high subsidies for small farm operations, and tractor work became reserved for large state-owned farms. Continued mounting loss of revenue and marked inefficiencies has led the GOT, at the urging of the IMF, to close SOTEXMA. The short-lived tractor experiment taught everyone concerned a lesson. Not only had Togolese agricultural planners (and practitioners) chosen a technology which was particularly inappropriate for tropical soils and cultivation, but even had it been an appropriate technology, the backward and forward linkages were not conceived or put in place in any way that could have contributed to the success of the activity. Briefly, institutional development was ignored - the weight of the tractor idea was evidently perceived as being sufficient in itself to carry the day. Animal traction was officially belittled during Togo's brief preoccupation with motorized tractors as being incapable of helping Togo's farmers participate in full measure in the "Green Revolution". Yet, as SOTEXMA's hard times became more generalized, the government began to grant begrudging acceptance of several donor assisted activities, mostly in northern Togo, which incorporated animal traction as the principal locomotive of agricultural development.

By the late 1970's, three important projects had started in the Kara Region: Projet Nord-Togo (UNDP/FAO), Amenagement de la Vallee de la Kara (FED), and Projet Culture Attelee (AID). The FED funded a draft animal procurement and animal traction training organization,PRODEBO, in order to supply its own project needs in the three southern economic regions. In 1982, at least twenty-three separately funded activities across Togo are involved in various levels of financing and importance in animal traction procurement, distribution and utilization. Rather than signal a more realistic approach to the need to improve food production, the wave of interest and project funding in animal traction farming systems has threatened to bring about its own set of intractable problems. The issue has been confused by unevenly applied subsidies and the lack of GOT-donor organization coordination in defining a suitable equipment package, a reasonable mode of financing and an appropriate cropping scheme.

Cognizant of the confusion among animal traction promotors, and increasingly aware and appreciative of the potential of animal traction to help realize food production goals, the GOT and interested parties in the donor community, including AID, have formed a working committee, chaired by a high-level representative of the Minister of Rural Development, and conveniently seconded in its secretariat functions by the administrative structure of PRODEBO. Created in 1981, the COCA (Comite de Coordination de la Culture Attelee) has become the official ground of debate and discussion of all questions of policy regarding animal traction. Its membership cuts across the ministerial and service lines and includes representatives of each of the donor (or banking) organizations and agencies which are involved with animal traction. The COCA has evolved as an advisory body to a point where its recommendations are referred to the Minister of Rural Development for adoption, promulgation and implementation. It enjoys official status and is governed by a set of by-laws (Annex Five). While in one respect, its formulation is almost ad hoc, without a permanent staff and a distinct physical location; in another respect, it is a body which is very much alive, active and capable of speaking with the authority of the GOT (and the concurrence of the donor community) in matters related to animal traction.

If the COCA is the instrument of animal traction policy formulation, it has had to depend on individual projects to implement policy in actual field-level situations. To date, this has not always been possible, particularly since the plethora of animal traction participants has often tended to impose the parochial dictates of their own organizations in imposing implementation plans upon COCA by making unilateral project decisions.

The GOT, with the support of representatives of the FED and AID, has undertaken to give a major impetous to the institutionalization of agricultural development, with animal traction as the primary farm management tool. A working group, within the COCA, has been meeting regularly since July 1981, at COCA's request, to draw up a plan for the organization of an institution which will oversee the implementation of the essential elements of a farm management system which uses animal traction. This institution (the French word for the proposed title is "project", as distinguished from an "organization" or "parastatal" appellations and formulations that were specifically rejected by members of the small working committee) will be responsible for

facilitating the interplay of the full range of animal traction-related policies and activities.

After more than a year's discussion of its format, the Minister of Rural Development is expected to sign and thereby put into effect, an executive order which will designate PROPTA as the implementing agent and according it an official status. The issuance of this order should be a Condition Precedent to the disbursement of that portion of AID funds designated in direct support of PROPTA's operations (See Section VII, Special Conditions, Covenants and Waivers). The European Economic Community's (FED) eventual planned contribution to PROPTA is similarly contingent upon PROPTA's creation. PROPTA (Projet de Promotion de la Traction Animale), will be charged with the promotion of conditions and practices which favor the adoption and economic utility of an intermediate farm technology which is within the reach of an important percentage of Togo's food producing farm families.

PROPTA will effectively replace the currently existing regional animal traction structures, PRODEBO (FED-investment) and Culture Attelee (AID-funded through the Kara Region DRDR). PROPTA will be a national structure in its physical organization, with two regional antennae in the south at Atakpame (the national headquarters as well), and Kara in the north. Details of the physical infrastructure and human resources which will be placed at the disposition of PROPTA by participating parties, is presented elsewhere in this document.

The purpose of AID and other donor and GOT assistance to PROPTA is to strengthen the national institutional capacities for implementing policy directives which flow from COCA. This will be accomplished by reinforcing PROPTA's outreach effectiveness in six key related sub-activities: animal procurement, animal health, farm traction equipment, credit, training, and monitoring and evaluation. The AID inputs include some technical assistance which will serve PROPTA through a multiple counterpart approach. PROPTA will grow as an institution as it acquires the capability to receive feedback from the various animal traction field activities, and maintain the flexibility to adapt a recommended farm management system to fit the needs of clients at all levels.

One of the main program channels through which PROPTA's services will be made available to farmer-adopters is the regional rural development organization, DRDR, situtated at the level of each of Togo's five economic regions. AID will support the funding of specific animal traction outreach programs in a defined zone of the two northern regions, the Kara and the Savanes. AID (and Peace Corps) experience in these two regions has led the design team to recommend AID project assistance to the introduction of farm management systems using animal traction as a basic tool in areas of the northern regions which are not now, nor are planned to be, covered by direct project assistance from any other of the major donors.

AID funding assistance will be directed through the existing physical and human structures of the DRDR, appropriately modified and reinforced. Specifically, this assistance will be concentrated in the areas of animal

delivery, a continued program of animal health, a yearly program of extension agent training, and the instituting of a vigorous program of monitoring and evaluating AID's own funded inputs at the field-level. The purpose of directing specific attention to these two DRDR structures, located in the areas of greatest concentration of animal traction farmer-adopters, is to open and help to maintain the important institutional linkages between the national PROPTA structure and that GOT regional organization which is charged with carrying out agricultural field extension services. At the present time, these DRDR structures, except for where they have been reinforced under the current animal traction AIP, have been unable to support a program of animal traction, and have relied instead on donor entities (FED, UNDP, IBRD, GTZ, Entente Fund and various PVOs) to underwrite most of the costs and provide almost all of the organizational support of animal traction programs. Given the commitment to the institutionalization of the animal traction farming system, the opportunity now arises for AID to make a direct contribution towards reinforcing the capacity of the two northern DRDR structures to implement PROPTA-supplied inputs and to reorganize their own regional-level farm extension activities.

The process of institutionalizing animal traction at the PROPTA (national) and DRDR (regional) levels does not automatically guarantee that essential services will be rendered efficiently to clients. But if the institutionalization process is complete, then it will include the ability to permit the sort of critical self-appraisals of the economic and social returns to investment that are needed to provide the flexibility to adjust animal traction field components and national policy, as needed.

An outline matrix, with brief explanations, of AID assistance to the institutionalization of a farm management system, using animal traction as a tool, is included below. An attempt is made to plot animal traction services to be funded by AID (and other donors, as well as the GOT), against the two levels, national and regional, which will have the most responsibility for maintaining the institutionalization of the system.

A third line has been added, marked by an asterisk, to indicate the impact of AID's intervention at the farm-level, or at the level of zone-based CATs (Centres d'Appui Technique). It does not indicate any project-funded formal institutionalization of animal traction at the farm-level, such as cooperatives. Rather,the pattern of institutional development which should occur under the project will result in enhancing the farmer-adopters' own local responsibility. In this way, farmer adopters move away from strict dependence on organizations, and towards an independance (and a local interdependance) that can be the precurser of developing private sector options which may become less costly and more responsive to clientel.

	Animal Purchase	Animal Health	Equip-ment	Credit	Training	Monitor & Evaluate
National Policy	I	S	M	I	I	I
Regional Services	I	I	S	M	I	I
* Farmers in Project Zone	M	M	I	S	M	M

I = AID-funded involvement in this sub-activity is Important

M = " " " " " " " Medium

S = " " " " " " " Small

NATIONAL POLICY

- Animal purchase: Project technical assistance will help COCA and PROPTA define a policy of animal buying and production that must consider such questions as importation of animals from herds in surrounding states; preferred race, sex, age and characteristics; eventual cost to farmer-adopters; repartition of animals among different activities in-country.

- Animal health: The FED and the GOT have a long-standing working relationship in defining and carrying out animal health policy and veterinary medicine programs on a national scale. AID inputs will serve only in an advisory capacity.

- Equipment: As a user of the animal traction mechanical unit, manufactured in Togo, the AID technical assistance will have the occasion to recommend modifications in the technical package. The PROPTA central office in Atakpame, under mainly FED and GOT operational support, has primary responsibility.

- Credit: The AID-funded Agricultural Economist, resident in Atakpame, has a direct and principal role in reviewing alternative medium-term credit plans, and in helping to institutionalize a harmonious system in collaboration with the CNCA (national agricultural credit bank).

- Training: Each of the members of the technical assistance team is responsible for elaborating training programs in their specialty which will become part of a national instructional package in animal traction that will eventually touch all operational levels.

- Monitoring and Evaluation: AID inputs to PROPTA are calculated to develop an effective capability to monitor the socio-economic environment of clientel, and to ensure that there is an institutional responsiveness to client input.

REGIONAL SERVICES

- Animal purchase: AID-funded inputs gather animal demand and organize supply and delivery, wherever required. A particular emphasis for these services is put on the Kara and Savanes regions.

- Animal health: This component is assured throughout the project life for those draft animals which are distributed in the specific AID project zones. A revolving fund in each of the two northern regions, and an animal health card, are essential elements.

- Equipment: UPROMA handles equipment deliveries and after-service repair, maintenance and spare parts training and supply programs. These parts of the projects are coordinated with the central PROPTA office and grow out of the FED and UNDP (UNIDO) contributions to animal traction in Togo. AID involvement is minimal.

- Training: AID inputs include yearly re-training programs for up to 200 members of the Kara and Savanes regional DRDRs. While other donors generally handle some training activities within their own project zone, AID training inputs will be used to supplement and improve those programs in the two regions.

- Credit: AID project personnel will work directly with Kara and Savanes region agricultural credit bank staff in the implementation of a medium-term credit program.

- Monitoring and Evaluation: AID inputs are designed to work closely with Kara and Savanes region agricultural extension and statistics personnel in the computation, analysis, interpretation and dissemination for use, of the information upon which decisions are made which directly affect animal traction institutionalization.

FARMERS IN PROJECT ZONE

- Animal purchase: AID associated inputs (Peace Corps volunteers and local-level Centres d'Appui Technique) are the conduit by which animal demand is made and animals are delivered for dressing. In some cases where warranted, farmers will be encouraged to obtain their own animals.

- Animal health: AID inputs help place veterinary supplies and information on animal care, nutrition, and shelter at the local level. This component will be institutionalized progressively, and become part of the farmer-adopters' own responsibility.

- Equipment: All of AID's technical assistance personnel will closely follow the actual utilization of various pieces of traction equipment for efficiency of operations in order to make recommendations in modifications to the tools or the methods of use.

- Training: AID-trained field extension agents are the first line of technical support for farmer-adopters. As farmers acquire their own skills, instruction in animal traction methods will be taken over at the local-level on a farmer-to-farmer basis.

- Credit: Agricultural credit agents are responsible for explaining the terms of credit programs to farmer-adopters, and for recuperating payments. AID involvement is not at this point.

- Monitoring and Evaluation: AID project interest in farm management will mean an on-going and important presence at the farm-level to complement and to verify investigations carried out by GOT field workers and personnel from other projects.

The implementation and financial plans for this project are explicitly designed to expand institutional effectiveness of animal traction and in particular to enhance management system capabilities of PROPTA and the Kara/Savanes region DRDRs in improving efficiencies of both the internal operations and external impact of these organizations. They are designed to allow flexibility to meet changing conditions and newly discovered requirements which will arise in the course of project implementation.

E. Policy Analysis

Policy considerations related to the project fall into three general categories: those that are specific to the office of the AID Representative in Lome; those that touch on current and continuing AID concerns; those that reflect priorities of the Government of Togo.

OAR: Agriculture has been designated by the FY-83 SPSS as the primary sector for AID involvement in Togo over the planning period through 1987. AID programming in agriculture and rural development, in response to GOT priorities and actual requests for assistance, is focused on activities that are to help increase food production and raise farm-family incomes. Specific programmatic themes in the accomplishment of these objectives are to be directed in the areas of agricultural extension services, practical training, and facilitating access to medium-term agricultural credit. The design of this project respects these program guidelines.

AID programming in Togo, in order to apply its limited resources towards an attainment of the sector goals described above, takes on added importance and influence as its projects are developed in concert with other donors and funding agencies. Originally conceived to complement the ambitious farm-family resettlement program funded by the FED in the two northern economic regions, the present animal traction project has been designed to supply an essential element of direction and coordination to a multidonor-sponsored agricultural development program which, while concentrating on the north, is national in the scope of its implications for Togo's agricultural policies.

The design team visited each of the major projects which use animal traction as part of a system of farm management. Discussions with personnel from these projects aided the design team in the formation of the AID inputs presented in the PP. A draft resume of the project design, in French, was submitted to representatives of the major projects. Rather than link the AID funded activities in a "collaborative sense" (AID terminology), to any other one (or several) donor(s), the AID project serves instead to assist the GOT in the coordination of all animal traction activities.

The project design also related to many other AID-funded project activities currently underway in Togo. Extension of AID involvement in animal traction in the northern-most Savanes region, in some ways the poorest and most lacking in development infrastructure, permits

some coordination of water site selection with the Togo Rural Water Supply Project (693-0210), which begins a campaign of approximately 150 wells in the Savanes region in the fourth-quarter of CY-82. The Togo Animal Traction Development Project will be prepared to be of some assistance in establishing training programs in animal traction for young farmers in conjunction with any future agricultural education and extension activity that AID may design in collaboration with Opportunities Industrialization Corporation, Inc., (693-0222). Opportunities may exist in the course of project implementation to include (with funding other than reserved for this project) specific pieces of solar (and other renewable energies) technology which are adapted to remote installations and intemperate conditions (i.e. Togo Rural Solar Technologies, IRT 698-0407.20). The accumulation of rural savings is an important part of an AID-funded program (Strengthening the Togo Credit Union Movement, 693-0220) which, in its second phase, 1983-1987, will begin to orient its loaning capacity towards opportunities in the agricultural sector, particularly in the Plateaux, Kara and Savanes regions (Togo Credit Union National Association, 69309224).

This project will continue OAR's policy of working together closely with private and voluntary organizations. Ten Peace Corps volunteers have been recruited and trained in animal traction activities which directly relate to this project. The AID design team has played an important role in formulating the PCV job descriptions and in choosing the volunteer living and working sites. Other volunteers will be attached on a part-time basis to some specific project activities, such as construction. Volunteers assigned to the Agricultural Education program (Togo Farm Skills, IRT 698-0407.26) within the Kara and Savanes regions, will have an opportinity to exchange information and perhaps share with training materials with this project. Several private and Volunteer Organizations are actively incorporating animal traction into their rural development programs, and as such, are members of the COCA (Animal Traction Coordinating Committee). Specifically, the AID project will follow-up on contacts already established with PVOs in the course of the AIP project with such organizations as Les Freres Missionaires de Campagne, Maisons Familiales, SODOPRODER (Projet Kante-Ferme). PVOs in Togo are all members of a private (government registered and ecouraged) committee, CONGAT, which benefits from an AID-funded (through an organizational grant with PACT) long-term resident program coordinator.

AID: The availability, under sound economic terms, of animal traction as an improved tool in the Togolese farm-families' food production system, fits squarely within AID's strategy for food sector assistance in Africa. The so-called animal traction package, as worked out by the design team and presented in this Project Papaer, holds a strong potential for improving the structure of agricultural production by working to relieve two major constraints to increased food

production which currently exist. This project will provide a calculated mix of incentives for a farmer to adopt a technology and for a government to begin to make farm policy decisions which are both in the long-term interest of increased food production.

In Africa, AID proposes to improve the physical structure of food production with better supplies of yield-increasing technology and by introducing improved tools which allow for a more efficient use of labor. The Technical Analysis of this paper addresses these issues.

The policy structure of food production is the second means by which AID will implement its strategy in Africa. While no sudden overt changes are expected in Togolese Government's policy with regard to official farm-gate prices, this project contains within its design, the seeds for a change in farm policy that is rational and acceptable by all parties. The same is true for the potential influence that the project holds for the government's future structuring of the necessary farm support services. The institutionalization of this progressive change in farm management, from a heavy, government imposed apparatus, to becoming a responsive instrument at the service of farmer initiative, is a part of this project's design.

The project's method of implementation of an assistance program in support of the aforementioned AID objectives, runs parallel to recent AID directives. The project at hand is to be implemented in coordination with other funding agencies. It has been designed with the foremost consideration of making a joint effort at all levels. Such coordination begins at the level of an active national committee (COCA), responsible for enunciating national policy with regard to the introduction of animal traction technology and related support systems. This nascent farm industry will be implemented through a government-established facilitator, PROPTA. The new national entity is expressly not the sole government sanctioned and protected wholesaler of animal traction goods and services, but rather will act as a coordinator which, at least in the beginning years of introducing animal traction technology, can clearly express and regroup demand across the country.

A national operation of this sort, with a built-in monitoring and evaluation unit, is susceptible to modifications over the years in order to respond to farmers' demands. The project fills AID's strategy to provide the intellectual support for policy-making by including a strong technical assistance component. The design team has included three elements of assistance within the monitoring and evaluation section of the project: (1) improvement ot GOT's ability to collect and process socio-economic data on animal traction related activities and to evaluate the effect of the various donor-sponsored animal traction programs on expanding food production and increasing

farm-family incomes; (2) support of the use of data and analysis in policy evaluation and formulation; (3) support for the creation of the linkages between an improved policy analytical capability and actual farm related economic policy decisions.

The project at hands responds to another aspect of AID's strategy in meeting the goal of increasing African agricultural production - building basic institutions to support agricultural development. (This subject is also treated under the Institutional Analysis section of this paper.) Provision for institutional development has been made in the first instance through support of the national and regional rural development structures (PROPTA and the Kara and Savanes regional DRDR's) responsible for the implementation of animal traction policy and field services. The design of the present activity includes support to agricultural field testing, extension services and continued in-house training (particularly at lower levels), and emphasizes the interdependent relationship between each of these components in contributing to institutional development.

Institutional development of animal traction in Togo is going to take a generation of persistant, hard, honest work at all levels. Animal traction as a farm management tool, implies a gradual change in the entire range of farm services. It will take at least twenty years of attention from the Togolese Government sources of technical (and financial) assistance, before animal traction is established as thoroughly practicable farming system. In line with AID's policy of declaring long-term commitments to achieve sector program goals, the project design team believes that AID can expect an eventual 10-year involvement in animal traction in Togo.

Some operational costs are to be assumed in the short and medium-term by AID and by other participating organizations. Many of these costs are occasioned in part by the period of adjustment required in the establishment of an adequate physical infrastructure. It will take some time before the level of operations under the national animal traction program reaches a point where PROPTA and the DRDR's will begin to realize a return on investment that will permit them to cover some operating expenses. Inefficiencies in operations (and consequent higher costs) will also persist until staff training begins to eliminate the worst manifestations of poor management.

This project also points towards the development of non-governmental institutional building as an important source of animal traction support services in future years. The animal traction program in Togo is designed to promote institutional pluralism. This will be accomplished through such sub-activities as cattle buying: facilitating the role of the individual cattle dealer in

supplying draft animals; training of master herdsmen: village-level farmers who can contract with neighboring farmers to dress and assist in instruction in the care of draft animals; training of blacksmiths: village-level tradesmen who can render important after-sales equipment services to farmers. Additional roles for private sector suppliers are foreseen in future years in such areas as veterinary products, the supply of fertilizer and low-cost farm tools, and marketing of matured draft animals for slaughter.

Finally, institutionalization of animal traction in Togo is addressed by this project by including efforts to incorporate the farmer's own participation in the development and implementation of a food production program. Without specifically encouraging the erection of local organizations, such as cooperatives, this project nevertheless focuses the attention of animal traction activities on a farming systems approach. Animal traction must provide direct evidence of benefits on the basis of individual (and then aggregated) increases in food production and income. The monitoring and evaluation component of this project will have the sort of contact with farmers that will provide this valuable information. A farming-system approach gives the farmer the best chance to be able to organize, operate and manage his own farm. With a viable unit in hand, a farmer can than decide for himself whether and how he wants to involve himself with agricultural inputs and commercial organizations.

GOT: The Government of Togo has several important issues and policy matters at stake in the approval and implementation of the present project. The first of these centers around the current discussions between the GOT and the IMF on the issue of the extended stand-by credit financing. The second relates to the all-important goal of self-sufficiency in basic food-stuffs. A third concern of the GOT in dealing with external development agencies is that of working within existing Togolese institutions. Finally, this project contributes to the attainment of a national development objectives in placing a particular accent on the two northern economic regions.

Many of the major concerns of the IMF in the course of the project negotiations which recently led to a tentative reallocation of an important line of the credit from the IMF's stand-by fund was the issue of the amount and the nature of government expenditures in the agricultural sector of the economy. A tentative agreement has been reached on several points which touch on this project:

a) Agricultural investment, as a percentage of total investment, will be increased.

b) Investments in the rural sector will minimize capital intensive operations, such as equipment and new physical structures which require strong doses of recurrent costs. Particularly vulnerable are incurred charges which would have a negative effect on Togo's balance of payments structure.

c) Government subsidies of parastatals, including those in the agricultural sector, which are showing regular operational deficits due to structural inefficiences, will be phased out. One of the first state-owned monopoles to close down operations is the motorized tractor-plowing service, SOTEXMA.

d) TOGOGRAIN, the small-scale national cereal grain marketing board, will be limited in its interventions in the domestic market. Subsidies for grain sales will be eliminated (this is perhaps the least firm part of the agreement).

e) Cereal sales beyond Togo's frontiers, will no longer be restricted year-round. The net effect on farm-gate prices for these food commodities should provide some farmer incentives.

The oft-repeated government goal of self-sufficiency in major food commodities by 1985 still stands as a guideline for programming government contributions to agricultural projects under the Fourth Five-Year Plan. Once a poor step-child to the costly motorized tractor program, the promotion of animal traction is presently accorded priority consideration in national agricultural planning. The modest AID-funded AIP project has received a center place during the high-level discussions on the organization of a national structure, which will implement government policies in the area of of animal traction. AID has the rare opportunity to play a major role in determining the responsibilities of all the parties involved in animal traction. The GOT regards U.S. assistance in this specially area as critical to the development of a sound national program of animal traction as a means to bring about important increases in agricultural production.

The Government of Togo attaches a great importance to donor organizations working within established Togolese institutional structures, provided that there are no major flaws in their design and composition. Rather than working outside of a system, perhaps in order to achieve short-term (and short-lived) gains, this project reinforces and improves those structures which are already in place, with which Togolese have a certain familiarity, and which stand a chance of being maintained long after outside financing has reached an end. AID inputs have been specifically solicited by the GOT in order to help the Ministry of Rural Development coordinate and integrate what has been to date a disparate collection of parallel structures which have been mounted by various funding

agencies. The AID activity will work with Togolese, within Togolese institutions, to assist in carrying out the development objectives of Togo in a manner prescribed under evolving Togolese government policy.

The Government of Togo has historically opted for a regional plan of economic development, with the country divided in five economic zones. AID support of rural development activities in Togo recognizes the more prevalent poverty in the two northern region, the Kara and the Savanes. The animal traction project follows the GOT's desire to specify development programs according to human and natural resource potential. The broad plains and valleys of the north are relatively sparsely settled, and situated in a climatic and vegetative zone that can productively accomodate draft animals. The GOT land reform measures, still under study, are due to promote the development of all available land for agriculture and grazing. AID's support of animal traction in the northern regions help to provide the GOT with the technical capacity to organize and to manage the area's rural development.

GENERAL TRAINING PRINCIPLES

It is a sound idea to precede the development of a training plan by a declaration of general principles or strong beliefs which are held in common by project designers and host country leaders.[1] While these principles may appear trite or obvious, they often have quite clear implications for the elements of a training plan to which they logically can lead. The statements which appear below have gained acceptance by both project paper designers and their host country collaborators.

1. Principle: Skill training is the single most important activity that will insure first success and secondly continuation or replication of the project.
   Implication: The quality of the persons assigned leading training functions is paramount.
2. Principle: Training is not solely the affair of training directors and their staffs.
   Implication: Skill transfer must become more widely practiced. Where center facilities include veterinarian, blacksmiths, carpenters, etc. that perform their tasks but currently do no training, this situation should be redressed. More people have to be involved in the training function and training must become uppermost in the minds of project participants.
3. Principle: Think of tomorrow when external assistance has disappeared.
   Implication: Concentrate training energies on national institutions.
   Implication: External assistants should not so much perform tasks as train nationals how to perform those tasks.
   Implication: The training function should be an integral part of the external assistant's job description, for which agreement is obtained during contract negotiation.
   Implication: Assure a viable counterpart arrangement, where each external assistant has one or two Togolese nationals working closely with him and where on-the-job training progress is monitored.
   Implication: External assistants should not train farmers, but should train that level of development agent that has a greater multiplier effect.
4. Principle: Train each category of participant to the highest degree possible in the optimal range of skills.
   Implication: If farmers can carve oxen yokes, don't give or sell them yokes made by professional carpenters.
   Implication: If encadreurs can safely administer drugs for animal health, don't insist that only a vet handle such operations.

The detailed Project Training Plan is found in Annex Seven to this Project Paper.

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1. One early proponent of this procedure is Ralph W. Taylor, of the University of Chicago, in his Elementary Principles of Curriculum and Instruction, 1949.

G. Engineering Analysis

The engineering, infrastructural component of this project is fundamental, yet limited in scope and complexity. The project will finance the construction of several types of small offices, houses, warehouses, sheds and corrals. Several existing field offices, apartments and warehouses will also be renovated.

Project Sites, Construction, and Renovation Needs

Project activities will be directed from several administrative locations. The national headquarters for PROPTA (Project for the Promotion of Animal Traction) is at Atakpame, the capital city of the Plateaux region. The northern headquarters for PROPTA will be constructed by the TAT project at Kara, capital for the Kara region. Housing for the Togolese project director will be built in Kara. Kara is also to be the administrative center for extension work in the region. At Dapaon, the capital of the Savanes region, no construction is planned. Existing facilities at DRDR will probably cover existing needs. In Tantiegou, just north and west of Dapaon, the TAT project will construct a national animal buying center for draft animals. A subsidiary buying station and training center will be completed at Agbassa in the Kara region. Agbassa was the main focus of animal traction activities during the Accelerated Impact Program for animal traction which began in 1979. A residence for the Director of the Center will be added to the structures already built there under the previous AID activity.

Besides the administrative and coodination points listed above, the project will base its outreach activities on the development of technical support centers called CAT's (Centres d'Appui Technique). Both new construction and renovation is involved in the CAT's. Ten CAT's will eventually be operating during the TAT project, five each in the Kara and the Savanes regions. These centers will be constructed as simply and basically as stability and durability allow, and will be appropriate to the rural milieu and their farmer training and support functions. An example of this simplicity in construction is the PRODEBO Training Farm at Kamina.

In the Kara region, four CAT sites have been identified and inspected. These are Kante, Nampoach, Kagnissi, and Warengo. The first two will be the subjects of renovation; the latter two of new construction. A fifth site will be chosen in 1983. Nampoach is the site of an old CAT now occupied by a DRDR production farm. An office/warehouse block exists along with a covered stable of steel truss construction, threshing floors, and rainwater collection and cisterns systems. Only minor repairs and construction of a corral are needed. Kante is also a renovation site. It now serves as an animal health corral with some storage and office space. Repairs to the corral and some storage space improvement is needed to turn it into an equipment and animal supply depot. Both Kagnissi and Warengo will require new construction, as will most probably the unidentified site.

In the Savanes region two renovations (Gando and Toaga) and one new construction site (Naki-Est/Nayega) have been identified. Another site for renovation is being considered. A fifth (unidentified) site will probably require new construction. The renovation sites are all old farm development centers built during the 1950's and 60's. They all have a complement of housing, warehouse, office, stable, and workshop space in various stages of use and repair. None require basic structural renovation. The key elements in each reconstruction are new corral facilities, repair to roofs, windows, and doors, and interior painting. In the Naki-Est Nayega area, a new CAT will be constructed west of Gorodo village. This center will have the same elements as the new CAT's in the Kara region.

Water supply is a concern at Nampoach, Kagnissi, Naki-Est/Nayega, and probably at the unidentified sites. While well construction for these five centers is budgeted under the project, assistance will be sought from an on-going AID-funded well-drilling project presently in the Savanes region, as well as from well digging equipment funded by the FED for the Kara and the Savanes DRDR area operations. Each site will enjoy at least one drilled and capped well with a manual (or foot) pump.

Sites and Works

In Kara, the project will build the PROPTA northern headquarters next to the DRDR building, a location which will facilitate coordination with regional authorities. The site is on a gravelly soil just north of the DRDR parking lot and south of a warehouse. Water and power will be available from municipal utilities. Individual septic systems will be necessary for the sanitary facilities. No unusual site development problems are foreseen.

The Project Director's house will be situated in a residential quartier in Kara, on gravelly soil. The house will consist of living and dining rooms with verandas, three bedrooms, a kitchen, a bathroom and storage and service dependencies. Utility hookups (water and electricity) will be made to the large Kara grid. An individual septic tank will be provided. A specific site has not yet been proposed. Once identified, it will be inspected by REDSO/WA Engineering to ensure physical suitability and easy access to all services.

At Agbassa, one house will be added to the two residences already constructed. The site will be just east of the current two dwellings. It is located on a medium depth ferrilitic oxisol underlain by lateritic gravel and at depth, a solid lateritic horizon. The house design will resemble that planned for the residences at the new CAT's.

The national buying center at Tantiegou will require the construction of six 6.25 hectare pastures, a block of four holding pens with associated chutes, a spray race, treatment squeezes, corral and loading ramps. Associated with the main animal handling facilities are a

combination office and storage structure, machinery shed, isolation pen, and pumping station with a cistern reservoir. The site is located adjacent to an irrigated agriculture center developed in the late 1950's. Holding pens and office/storage structures are to be located on an exposed well-drained lateritic horizon neighboring a sandy clay-loam bottomland (bas-fond) on which the pasture fences will be erected.

While soils and site characteristics naturally vary at the CAT sites chosen across the project area, their selection was based on consideration of general criteria of land availability, good drainage (for corral construction), road access, water availability, and favorable topography. The REDSO/WA engineer visited all positively identified sites except Nampoach and Kagnissi. Before construction or renovation begins at these and the as yet unidentified sites, a REDSO/WA Engineer will make a site visit to verify their acceptability.

Contracting Mode

The design team recommends the use of a FAR (Fixed Amount Reimbursement) contracting mode for design and construction of planned structures. The FAR contracting procedure will be established with the assistance of the REDSO/WA engineering staff.

It was not believed advisable to prepare detailed plans of structures at the PP stage. Instead the REDSO/WA engineering staff have prepared criteria for durability, thermal design, and material selection which will be used to guide evaluation of design bids and monitoring of the construction process. (See Annex Eight)

A request for proposals to design project structures will be prepared by the OAR/Lome with REDSO/WA assistance. Proposals will be evaluated according to the criteria above. The selected design firm should have the capability to undertake the role of a supervising architect during actual construction. Construction of the approved design will be subject to a competitive bidding process within Togo. With REDSO/WA assistance, a FAR contract will be negotiated to establish the advance payment (up to 40%) and monitoring requirements needed to ensure construction quality and timely delivery.

Some elements of the construction requirements may be removed from the FAR process if they can be more expeditiously handled by project and DRDR personnel, e.g., corral construction at the CAT's. Such decisions will be made by OAR/Lome in consultation with the Government of Togo with REDSO/WA guidance.

Design and Construction

The design and construction of the centers and buildings described in the preceding sections are well within the capability of several agricultural firms and building contractors presently working in Togo.

Two recently completed examples of competent, timely and low-cost locally-contracted designs and constructions are the $140,000-Family Health Center in Lome, financed by AID and the $160,000-Projet Vivrier offices, houses and warehouses in the Kara area, financed by the Entente Fund.

Construction Cost Estimates

Cost estimates were obtained by reference to construction contractor files on actual costs for July 1982. The final cost estimates were made by upgrading roof and ceilings to provide for more durable structures than those now constructed in rural areas in Togo. Examination of past inflation rates for construction materials led the design team to build in a 17% inflation factor for construction which will be done during calendar year 1983.

For office and residential construction, two estimates of square meter costs were developed. The first includes installation of water and electric systems and has been costed at $250 per square meter. The second estimate is for rural construction, office and storage structures without electrical wiring and extensive plumbing needs. Costs for this type of construction are reduced to $185 on a square meter basis.

The quoted costs are all inclusive. They incorporate architectural design and construction management, labor, materials and transport, site development, worksite shelter and housing arrangements, contracting costs, and all other fees, permits, and indirect charges. The construction cost estimates can be found in Annex Eight.

IV. FINANCIAL PLAN

THE AID PROJECT GRANT

AID grant expenses of about $5 million including inflation and contingencies are budgeted most heavily during the first half of the project obligation schedule. First year spending requirements are disproportionately large as much of the construction is a prerequisite to other project activity and the revolving funds require most of life-of-project amounts up-front for cash-flow purposes (See Tables 1 to 5, Annex Ten for a budget breakdown).

Since the technical assistance team will not arrive until the end of year 1, first year obligations include funds for the Interim Project Coordinator and an Assistant. During year 2 to 5, long-term technical assistance costs are in proportion to the 4 person-year of work in years 2 and 3 and the 2 person-years in year 4 and 5. The last six months of the project involve one person-year of technical assistance for the Project Coordinator and Agricultural Economist to take advantage of information gained from the fifth growing season. Short-term assistance budgeted includes the Livestock-specialist and Agronomist visits in year 4 and 5 and training or data specialists, beginning in year 2.

Vehicles are to be purchased locally in year 1 and assuming a useful life of 2 1/2 years will be replaced in year 3. Most other commodities will be purchased during the first half of project life with replacement of small office equipment such as typewriters and copier machines in year 3. All major office furniture will be procured locally in year 1 except for metal filing cabinets which are generally unavailable in Togo. Training and survey equipment is budgeted to begin in year 2 to coincide with arrival of the technical assistance team.

Construction will begin early in year 1 and is expected to be finished by early year 2. Estimates for all construction include a 17% inflation factor for material price rises anticipated before construction completion. At the five locations where it is feasible to renovate existing technical support centers (CATs), the cost is only $6,000 per center compared to new construction costs per CAT of $30,000. The drilling of seven wells will cost $70,000 with digging equipment already supplied by the FED to Kara and Savanes regions DRDRs, as well as drawing on the equipment resources of the Togo Rural Water Supply project (693-0210).

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Revolving funds require $575,000 during the first 2 years of the project with the animal fund receiving $225,000 of its allotted $300,000 during year 1. The equipment fund, which has a slower turnover rate, will be established in equal increments in years 1 and 2. The veterinary fund of $25,000 will have the fasted replenishment rate and needs to be entirely financed at project inception.

Operating costs financed by AID comprise only about 7% of the U.S. contribution, involving primarily some local salaries, travel expenses of GOT personnel, small supplies and maintenance of cars, motorcycles, mobylettes and bicyles. Operating costs are expected to remain constant over the life of the project, albeitsubject to inflation.

AID financed local currency expenditures during the life of the project are $2,466,000, about 49% of total project costs. All construction expenses ($412,000) are through host country contracts in local currency, about 75% of commodity purchases are in local currency and the establishment of the revolving funds require $575,000 in local currency. The $210,000 in local costs for long-term technical assistance includes rent and utilities for team housing. The short-term technical assistance local costsprimarily involve secretarial, translation and communication expenses. The mid-term and final evaluations require translation and secretarial services in local currency of $22,000.

The management of local currency funds is primarily assumed by the Project Director in Kara with the technical assistance of the Project Coordinator uniquely responsible for local costs under the technical assistance contract. Host country construction contracting, local commodity purchase, operating expense disbursements and the revolving funds are all directly under the control of the Project Management unit in Kara.

The following funding summary assumes an exchange rate of 300 CFA = $1.00, contingencies of 10% and an inflation estimate of 12%. Since the actual exchange rate has risen greatly during the past year, resulting in a net rise of dollar value of about 30% during the past six months, it is assumed unlikely that the exchange rate will drop below 300 during the first half of the project when the majority of all AID financed local currency costs are to be realized. Given the high rate of overall expenditures during the first 3 years of the project when inflation can be most accurately estimated, a 12% inflation factor is safe and reasonable.

GOVERNMENT OF TOGO CONTRIBUTION

The $1,669,221 contribution by the Government of Togo, including inflation and contingencies, consists of services and materials to com-

plement AID inputs and resources which the GOT has already demonstrated its ability to provide. Almost one-half of the GOT budget involves salary costs for personnel working full-time or at least half-time on project activities, most of whom are already employed by the government, some of them under the current AIP activity. The GOT will support a staff of four full-time professionals at Kara and Agbassa, two professionals at Tantiegou working about 75% of their time on project activities, and seven others at PROPTA headquarters in Atakpame who will average about half-time on the project. Also included in GOT financed personnel costs are 17 office support staff and 68 laborers, including 33 herders, cattle-breakers, and security guards for the 11 CAT centers.

There are 24 vehicles to be purchased by the GOT, including 13 for the Kara and Savanes regions and 11 for Atakpame. Vehicle replacement will occur in year 3. As in the AID purchases of vehicles, vehicle operating costs will be the major GOT contribution after personnel costs. All gasoline for project vehicles will be provided by the GOT, purchased at the local market price, except for the technical assistance team's vehicles which will use AID-purchased duty-free gasoline. Vehicle related costs comprise 35% of the overall GOT contribution.

During the AIP project, the GOT contributed cement, wood, steel reinforcement bars, aluminium roofing and other construction materials. These miscellaneous construction contributions are expected to be increased to $100,000 for the new project.

Other costs for the GOT include utility installation, small office supplies, and some training. The GOT will supply furnishings for the Project Director's home, to be constructed with AID financed funds.

AID project grant agreements require the host government to conduct annual audits of project records. The Office of Program Financing in the Ministry of Plan and Administrative Reform will offer this service as it has during the AIP activity, submitting audit reports to appropriate GOT officials and the AID Project Manager.

During the course of the AIP activity, the GOT contribution was timely, adequate and fulfilled GOT commitments. GOT project financing originates with the Ministries of Rural Development and Planning and Administrative Reform which seek the Ministry of Finance's fund disbursement approval. The GOT has no plans to use any PL-480 generated counterpart funds in this project. The AID Project Manager and the Project Director will closely monitor the status and uses of the GOT contribution and advise GOT officials of project needs on at least an annual basis, to ensure smooth and continuous funding.

REVOLVING FUNDS

The two components of cattle revolving fund; the general cattle purchases and the pilot herds' fund, will total $300,000. Based on cash flow needs and the likely reimbursement schedule by cattle buyers outside the project, most of the fund should be made available during year 1. As increments are deemed necessary by the Project Director, in coordination with DRDR and the Project Coordinator, the AID Project Manager will request AID to make deposits to this cattle revolving fund account at the CNCA in Kara. The amount in this account must be sufficient to meet DRDR purchasing needs on at least a seasonally adjusted quarterly basis and to continue purchasing during the 3-4 week lag time required for the processing of the next deposit from AID. The DRDR Directors in Kara and Savanes will jointly produce a cattle buying plan with the number of cattle required during the next several months in both regions to be submitted to PROPTA in Atakpame. As directed by PROPTA, the Project Director (with the Project Coordinator as a consignor) will transfer sufficient funds to a cattle purchasing account at CNCA in Dapaon. The PROPTA agents withdrawing funds from this account are the Togolese Cattle Purchasing Agent and his Peace Corps counterpart who will prepare monthly written reports for PROPTA management on purchasing volume and costs. PROPTA will keep the DRDR Directors informed on the status of this cattle purchasing account to ensure timely replenishment from Kara. Cattle for two pilot herds will be purchased from the same CNCA account, although this fund will be accounted for separately in project records and PROPTA records.

During the first year the cattle revolving fund at CNCA in Kara will experience a net cash outflow, since project farmers will not begin to make the first of five annual repayments until year 2 and some lags may arise in payments from non-project buyers. The fund will be replenished by payments in full from non-project buyers and more gradually from the 20% annual payment by adopter-farmers. Three percent of the 8% interest paid annually by project farmers to the cattle revolving fund of the CNCA will be ear-marked to cover the risk of loan default. (The reporting requirements for this fund and the controls needed to assure accountability are described in the Accounting Controls section of this analysis.)

The equipment fund will be established at the Kara CNCA in the same manner as the animal fund in Dapaon with the DRDR Directors assessing demand and communicating their order to PROPTA. PROPTA, as the equipment buying agent, pays to UPROMA, the equipment manufacturer 10% down-payment for equipment to be ordered. When the order is finalized, PROPTA pays 40% of purchase price as a non-refundable deposit for UPROMA to begin production. The remaining 50% of purchase price is due to UPROMA within two weeks after final delivery of the equipment.

As with the animal fund the Project Director and the technical assistance Project Coordinator co-sign checks to effect the fund transfer directly from the Kara CNCA to UPROMA. Since the lag time between order and delivery is over 12 months, the equipment fund will decrease rapidly during the first 2 years of the project and begin to be partially replenished in subsequent years as farmers repay loans. Unlike the animal fund, which is self-sustaining in the long-run, the equipment fund is expected to decrease in proportion to any subsidy granted to equipment purchasers.

The veterinary fund will be established with a one-time cash transfer of $25,000 during the first year of the project and will function similarly to the animal fund. Much of the fund will be used at the beginning of the project for U.S. procurement of veterinary supplies. These costs, as well as vaccination costs, will become part of the cattle purchase price and will be recovered as non-project buyers pay for cattle and project farmers repay loans.

The veterinary fund will also finance the on-going cattle health program which will sell its services to farmers on a cash-basis, with sale proceeds deposited back into the fund. In order to enhance accountability, this fund should also be maintained at the CNCA in Kara (with periodic transfers, as required, to veterinary account at the CNCA in Dapaon) and monitored closely by the Project Financial Manager and the Project Director.

ACCOUNTING CONTROLS AND REPORTING REQUIREMENTS

The large proportion of local currency expenditures in the AID grant and the specific procedures required for administering revolving funds necessitate careful design and adherence to specific control measures. It is essential that project management include qualified financial management personnel who are aware of AID financial procedures and reporting requirements.

Since Kara is the project headquarters site, its staff will include a senior level accountant with several years of experience to serve as the overall Project Financial Manager. AID will assure that this Financial Manager is trained in those areas of accounting procedures which are specific to AID and to this project in particular. Among other responsibilities, the Financial Manager will supervise at least one accountant at Kara to maintain day-to-day records, inform the AID Project Manager and the Project Director and Project Coordinator of budgetary variances, cash-flow status and control weaknesses when appropriate, and comply with all written reporting requirements of the

West African Accounting Center (WAAC), the fiscal center for AID Lome. In order to fulfil these requirements the Financial Manager should receive periodic short-term technical training and assistance by AID, including short-term training in Lome early in the first year of the project. Also during the first year, the Financial Manager should visit WAAC for a thorough briefing on AID accounting procedures and requirements, WAAC will follow-up with necessary financial management support when its representative makes his or her periodic visits to Togo.

The Project Director in Kara will ensure that AID receives project quarterly reports demonstrating by budget line item, cumulative disbursement status and budget variances to date. To verify that revolving fund current account balances are sufficient and necessary, quarterly reports will include all cash outflows from purchase of animals, equipment and veterinary supplies and all cash inflows from AID deposits, farmers loan repayments and reimbursements for animal purchases for other projects. In order to assess the suitability of the cattle purchasing payment procedures in Dapaon the Financial Manager will visit the buying station at least monthly to compile a report detailing any non-check (purely-cash) transactions and summarizing overall financial activity.

The Dapaon cattle purchasing center staff will include an accountant to record cattle transaction and forecast future needs. The PROPTA buying agents (a Peace Corps volunteer and his or her counterpart) will have check signing authority on the cattle purchasing account. However, the absence of widespread check payment systems in the region at this time limits the speed at which a check system can be made fully operational. As a transitional step toward enhancing confidence in a checking system, cattle sellers will receive checks drawn on the PROPTA cattle purchasing account at CNCA in Dapaon to be cashed during the two mornings each week that a buying agent will be at the CNCA office to facilitate transactions involving cattle vendors. Eventually, when vendors understand and have confidence in the checking process, the presence of the buying agent at CNCA will be unnecessary. Other local expenses in the Dapaon area will be in cash through an imprest petty cash fund of an amount as determined appropriate by the Financial Manager. The Dapaon accountant will submit monthly reports to the Financial Manager and Project Director in Kara detailing cattle volume, prices, petty-cash fund uses, and purchasing activity projections for the next quarter. Copies of bank reconciliations and all receipts should also be forwarded to Kara for inclusion in project status reports.

The staff accountants at Kara and Dapaon will meet at least monthly with CNCA credit agents in their respective cities to review loan procedures and assess loan repayment delinquencies. Delinquent loans and overdue interest should be detailed in quarterly reports submitted to

project management and to the AID Project Manager. An analysis of CNC collection efforts and procedures should be included.

The home office of the technical assistance team will submit semi-annual financial reports to AID illustrating contract expenditures to date, projections for the next six months and the financial implications of changes in the work plan. Reports should be by budget line item, separating dollar costs from local currency expenditures, and received by AID within 30 days after the end of each six-month period.

V. Implementation Plan

1982

August	Project Review and Approval by AID/W
September	Project Agreement signed by GOT and AID
	Project Management Unit of AID AIP assumes responsibility for Interim Phase
	Project Facilitator recruited and hired locally
	Assignment of Peace Corps Volunteers
October	Initial Project Implementation Letter sent by AID to GOT
	Draft PIO/C's
	Draft PIO/T
	Departure of Project Director for training
November	Condition Precedent met (Creation of PROPTA)
	First disbursement of Project funds
	Preparation of construction and engineering plans
	Prepare RFP for Technical Assistance
	Bids submitted for construction contract
	Contacts initiated between Project and centrally-funded environmental monitoring project(s)
December	Submission of bids for Technical Assistance
	PACD of AID AIP

1983

January	TAT Interim Phase begins
	Recruit and engage Interim Project Coordinator
	Evaluation of contracting bids for construction

February	Award construction contracts
	Order equipment and material
	Evaluation of bids for Technical Assistance (GOT participation)
March	Begin construction of project offices and residence of Project Director
	Selection of Technical Assistance contractor
April	Begin construction/renovation of CAT's
May	Sign contract for Technical Assistance
June	Return to Togo of Project Director
September	Arrival of Technical Assistance Team
	Assignment of PCVs
	Work-up of environmental monitoring program
	Provisional reception of project offices and residence of Project Director
October	Provisional reception of construction of CAT's
1984	
January	Internal evaluation of Interim Phase (Include TAT TA, GOT, AID (OAR), REDSO)
	Lay-out project plan-of-work
	Implementation of project environmental monitoring program
February	Short-term Technical Assistance: Training Advisor and Data Specialist
March	Final reception of construction of offices and residnece of Project Director
April	Final reception of construction of CAT's
September	Assignment of PCVs

1985		
	January	Internal evaluation
	February	External mid-term evaluation
		Short-term Technical Assistance: Training Advisor
		Preparations of PIO/C's and ordering for replacement vehicles and equipment
	September	Assignment of PCVs
1986		
	January	Short-term Technical Assistance: Data Specialist
		Internal evaluation
		Departure of Technical Assistance Team members: Agronomist and Livestock Specialist
	September	Assignment of PCVs
1987		
	January	Short-term Technical Assistance: Agronomist and Livestock Specialist
		Internal Evaluation
		Adjustment of project plan-of-action
	September	Assignment of PCVs
1988		
	January	Short-term Technical Assistance: Agronomist and Livestock Specialist
		Final external evaluation
	March	Departure of Project Coordinator and Agricultural Economist
		PACD

VI. Evaluation Plan

INTRODUCTION

This evaluation plan has taken into account the complementary relationships between the monitoring and evaluation activity within the project, and the internal evaluations and the external evaluations. It is expected that information generated by the M&E unit will be of direct usefulness to both the annual internal evaluations and the periodic evaluations.

INTERNAL EVALUATIONS

These evaluations will be held yearly and are fully intended to be more than just a listing of the past year's doings and a projection of the next year's activities. These evaluations are not to be limited to only project technicians, but should include participation from GOT Ministries concerned, AID/Togo and technicians from REDSO/WA in Abidjan. The purpose of these internal evaluations is to take stock of the progress of various project activities, discuss the arguments for adjustments in the direction of any of these activities, and lay out detailed plans of work for the coming year.

Participation by REDSO technicians and AID/Togo will be extremely useful for two major reasons. These internal evaluations will permit AID to keep fully abrest of the project developments and assist REDSO in programming any needed short-term advisory interventions. The internal evaluations will also permit AID programmers and technicians to have periodic inputs into the ongoing monitoring and evaluation activity, particularly in terms of tracking social and environmental variables.

EXTERNAL EVALUATIONS

Two external evaluations have been programmed. They call for participation by GOT, AID/Togo, REDSO staff and a total of 5 person-months of outside consultant services, as well as by project staff.

The first one will occur two years after the arrival of the technical assistance team. This will be an appropriate point in time to review the development of project activities and to determine how well project objectives are being addressed. Project technical advisors will have adequate time to initiate fully-developed strategies and programs of work.

The second one will take place during the last year of the project and will assess overall project performance. The evaluation will also be expected to assess the progress of various strategies for project activities. They will also make a formal comparison between end-of-project analysis and the analyses contained in the project paper.

TIMIMG

As this is an agricultural project, the timing of the evaluations is greatly influenced by the cropping seasons. It is felt that both the internal and external evaluations should occur early in the calendar year. This will allow information from the previous cropping season and harvest to be compiled, interpreted and put into useable form.

EVALUATION CALENDAR

January, 1983: First Internal Evaluation

Participants: Project Staff, AID/Togo, REDSO Technicians

Issues : Review of Construction Program,
Review of Commodity Program,
Evaluate Interim Phase,
Review Initial Plan of Work of Technical Advisors,
Review Detailed Program of Coming Year.

January, 1984: Second Internal Evaluation

Participants: Project Staff, GOT, AID/Togo, REDSO

Issues : Review project activities,
Review first year (PY 2) results and adjust strategies,
Program coming year activities.

January-February, 1985: First External Evaluation (Mid-term)

Participants: Project Staff, GOT, AID/Togo, REDSO, Outside Consultants

Issues Review project progress in light of Project Paper,
Evaluate Technical Assistance,
Make recommendations for new directions in project activities,
Critique of M&E methodology and subjects of investigation,
Up-date the economic and financial analyses.

January, 1986; Third Internal Evaluation

Participants : Project Staff, GOT, AID/Togo, REDSO

Issues : Evaluate project response to external evaluation,
Program shift of project responsibilities to GOT,
Begin hypothesizing recommendations for Livestock and Crop Management.

January, 1987: Fourth Internal Evaluation

Participants; Project Staff, GOT, AID/Togo, REDSO, Outside Consultants,

Issues : Evaluate project response to first external evaluation,
Up-date PP analyses to present,
Assess goal achievement and project performance,
Evaluate use and justification for continued AID support after end-of-project.

January, 1988 : Second External Evaluation (End of Project)

Participants: Project Staff, GOT, AUD/Togo, REDSO

Issues : End-of-Project evaluation,
Compile time-series economic analysis of ANTRAC
Compile cross-project comparisons,
Evaluate Technical Assistance,
Evaluate project performance and goal achievement,
Compare End-of-Project and Project Paper analyses.

VII. Special Conditions and Covenants

Condition Precedent to Disbursement Under the Grant

Prior to disbursement under the Grant, or to issuance by USAID of documentation pursuant to which disbursement will be made for the financing of activities, related to the organization and support of PROPTA (The National Animal Traction Promotion Project), the Grantee will, except as the Parties may otherwise agree in writing, furnish to USAID in form and substance satisfactory to USAID:

> An official statement of the Minister of Rural Development, authorizing the creation of the PROPTA (The National Animal Traction Promotion Project), accompanied by an officially accepted and approved set of statutes, or other such organizational documentation, which determines the responsibilities and authorities of PROPTA.

Special Covenants

Water Quality

The Grantee agrees (a) that pumps will be installed only on wells that discharge water that is safe according to WHO standards, and (b) that adequate measures will be taken to safeguard the quality of the water.

Maintenance and Repair Systems

The Grantee agrees to pursue actively negotiations with those donors who are currently engaged in metal-working training related to animal traction projects, so as to provide firm assurances at the earliest possible date of adequate funding for a satisfactory program of training and establishing village-level metal-workers. So-called blacksmith shops, spread out over the country, including the Project Zone, will be capable of furnishing on-going maintenance and repair (and eventual partial manufacture and assembly) of parts to the animal traction farming equipment which is to be furnished under this Project.

TOGO ANIMAL TRACTION DEVELOPMENT

(683-0218)

PROJECT PAPER

ANNEXES

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ANNEX ONE

LOGICAL FRAMEWORK

TOGO ANIMAL TRACTION DEVELOPMENT (693-0218)

LIFE OF PROJECT: $6,660,000
FROM FY-82 - FY-86
TOTAL U.S. FUNDING: $4,990,263
DATE PREPARED: AUGUST 1982

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATIONS	IMPORTANT ASSUMPTIONS
GOAL		GOAL-LEVEL INDICATORS	PURPOSE/GOAL
Increase the productivity and income of farmers and herders in northern Togo.	1. Increased volume of marketed produce from farmers adopting animal traction in northern Togo. 2. Increased yields of basic cereal and pulse crops in northern Togo. 3. Improved cattle herd structure, growth rates, and health.	1. Agricultural census annual sample survey and probable 1992/93 agricultural census. 2. PROPTA monitoring and evaluation unit reports. 3. Agricultural census annual sample survey and probable 1992/93 agricultural census.	1. Nonformal market prices provide an incentive for surplus production. 2. State foodstuff market share continues to be negligible factor in the marketplace. 3. PROPTA service charges and operating efficiency sufficient to maintain supply and coordination services. 4. DRDR maintains revolving funds separate from general budget funds and obtains requisite financing for non-reimbursable charges (personnel and related costs). 5. Pilot herd findings are developed into animal health service and animal production extension programs.
PURPOSE	EOPS	EOPS	OUTPUT/PURPOSE
To restructure, coordinate and harmonize animal traction extension in Togo through: a) strengthening of the national animal traction project's (PROPTA's) animal supply, training, credit, and monitoring and evaluation units. b) creating extension support centers in Kara and Savanes regions to work with farmers and agropastoralists.	1. The national animal traction project (PROPTA) providing coordinated administration of animal supply, extension training programs, and linkages to CNCA on medium-term credit supervision for at least half of the existing projects in Togo; (with other donor funds providing the administration of national equipment supply and animal health care follow-up.) 2. CAT staff trained and operating an improved animal traction extension program with established backstopping from sector and sub-sector extension chiefs, veterinary staff, and animal production personnel. 3. 500 farmers using improved and adopted animal traction technology which permits repayment of loan obligations, replacements of animals by direct farmer purchase, and continued profitable mixed farming operations. 4. Pilot herds giving preliminary indication of how herd structure and growth rates can be improved and how cows can be used for animal traction without reducing cow fertility or increasing calf mortality.	1. Project Evaluation 2. Project Evaluation 3. Project Evaluation 4. Project Evaluation	1. GOT provides necessary personnel and operating funds for PROPTA amd regional programs. 2. Other donor-assisted projects agree to provide micro and project-level data to PROPTA monitoring and evaluation unit. 3. Other projects and national training institutes agree to participate in joint review, modification of training programs. 4. UPROMA continues to operate and develops an outreach capacity for rural artisans. 5. Other donors supply initial capital requirements of PROPTA units for equipment supply, animal health care follow-up, and participation in uniform medium-term credit system. 6. Animal herd growth rates and structure are maintained at current level or improved. 7. CNCA makes staffing pattern adjustments and participates in training to improve ag credit supervision.

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OUTPUTS:

1. National Animal Buying Center established at Tantiegou and functioning with standard animal health and maintenance procedures. Agbassa restructures as a buying subcenter.

2. PROPTA unit for monitoring and evaluation established.

3. PROPTA unit established for production of animal traction training modules.

4. PROPTA procedures established for bulking, processing, and administering animal purchase orders for animal traction projects in Togo.

5. PROPTA-North headquarters established in Kara.

6. PROPTA-established pilot herds with herd record-keeping procedures at Tantiegou and Agbassa.

7. Regional revolving fund procedures developed to maintain veterinary input, animal traction equipment supply, and animal supply for Kara and Savanes DRDR's.

8. Extension support centres (Centres d'Appui Technique - CAT's) established to extend equipment and animals, train farmers, hold demonstrations of animal traction field operaions, and run limited adapted field tests.

9. Animal Insurance Program established for Kara and Savanes regions.

10. CNCA procedures established for supervision of medium-term agricultural credit in Kara and Savanes regions.

MAGNITUDE OF OUTPUTS:

1.a. Interim period operating level of 1,500 animals.
b. An annual average of 2,000 animals purchased and delivered to projects throughout Togo.

2.a. Interim period monitoring and evaluation unit established.
b. Annual updates of technical, economic, financialand social feasibility of animal traction with one special study prepared annually for COCA.

3.a. Interim period: revision of animal traction handbook.
b. Annual revision of animal traction handbook. Developing of training modules, graphic and audiovisual materials for training in animal breaking and training, on-farm animal husbandry, equipment assembly, maintenance, and repair, equipment field adjustment; crop production; intercropping; forage crop rotations; medium-term and production credit; extension methods; extension supervision; credit supervision; crop and herd record keeping.

4. Orders received and processed; payment obtained for an average of 2,000 animals annually.

5.a. Interim period: office and residence constructed, GOT personnel assigned, management and accounting system in place.
b. Headquarters handles coordination for an average of 2,000 head of cattle and 1,000 equipment units annually.

6. Two pilot herds at 40-80 animals each.

7. Three revolving funds established to support animal traction extension in Kara and Savanes regions.

8.a. Interim period: 5 CAT's rehabilitated, 5 CAT's constructed.
b. 10 farmers trained annually at each CAT.
c. 4 major demonstrations held annually.
d. 4-8 hectare farm established at each CAT to carry out tests of animal traction technologies.

9.a. Interim period: 700 animals receive ear-tatoo and health cards.
b. Central registry set-up, health-card and tatoo system followed for an additional 700 animals each year.

OUTPUTS:

1. First internal evaluation with GOT, REDSO/WA, OAR/Lome, and Technical Assistance Team for interim period.

2. Annual internal evaluation and programming exercise.

3. Mid-term evaluation.

4. Annuals reports at PROPTA, DRDR Kara, DRDR Savanes, CNCA, UPROMA.

5. Reports at REDSO/WA Controller's office.

6. Accounts of PROPTA, PROPTA-North, DRDR's.

7. Monitoring and evaluation unit's studies of farmer adoption rates and impact of animal traction on farm characteristics.

8. Pilot herd records.

INPUT/OUTPUT:

1. Project approval and Pro-Ag signed before September 30, 1982.

2. Personnel Services Contract for Interim Project Coordinator let to a qualified individual by Decerber 1982. Short-term facilitator hired locally by same date.

3. Building design and construction contracts drawn up and let out in timely fashion.

4. Commodity orders and delivery proceed on schedule.

5. PROPTA statutes approved by the Ministry of Rural Development before December 1982.

6. FED V financing obtained in early 1983 for animal traction equipment and draft animal health care units with PROPTA.

7. AID/W able to let a contract for technical assistance to a qualified firm in a timely fashion.

8. Technicians arrive on schedule (August/Sept.'83)

9. Ministry of Rural Development assigns qualified staff to PROPTA and DRDR upper and middle-level staff positions.

10. COCA maintains a policy rule and ensures closer participation among donors and GOT in PROPTA operation.

11. National Directorate of Agricultural Research, IRAT, SOTOCO, SAFGRAD/OUA provide data and recommendations from agronomic experimantation.

10.a. 100 credit files and loans approved and supervised annually.
b. CNCA credit agents receive two training sessions annually.
c. Repayment, rescheduling, or repossession norms adhered to for 500 files by the end of the project.

INPUTS: ($'000)

	First Year	All Years
AID	1,000	4,990
HOST COUNTRY*	283	1,670
TOTAL	1,283	6,660

* 1 US$ = 300 CFA

INPUT Categories (AID only): ($'000)

Technical Assistance	1,966
Commodities	412
Construction	400
Revolving Funds	575
Operating Costs	382
Subtotal	3,735
Inflation	881
Contingency	374
TOTAL	4,990

ANNEX TWO

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INTRODUCTION

The purpose of the Togo Animal Traction Development Project (TAT) is to restructure, coordinate and harmonize animal traction extension through:

1) Strengthening the National Animal Traction Program (PROPTA) in the areas of animal supply, personnel training, credit coordination and monitoring and evaluation activities;

2) Creation of Extension Support Centers(CAT's) in the Kara and Savanes regions to promote animal traction activities with farmers and agro-pastoralists.

Unlike most West African francophone countries, there exists a clear and public political commitment to the promotion of animal traction for small farmers in Togo on the part of the government. This has resulted in the advent of a large number of donor-assisted animal traction projects in recent years (23 at last count). However, the onrush to support this political commitment has created a dispersed, uncoordinated and perhaps hasty promotion of animal traction.

With reference to the AID-assisted animal traction AIP activity, to the experiences of other projects and to lessons learned elsewhere in West Africa, this project will assist the GOT in better defining an economic and technical program for the promotion of animal traction.

PROJECT ACTIVITIES

TAT-supported activities will be implemented at two distinct levels and in a number of areas directly related to an agricultural system based on the use of animal traction. An interministerial, multidisciplinary Committee for the Coordination of Animal Traction (COCA) was created in 1980 to determine national policies vis-a-vis animal traction. COCA has recommended to the Minister of Rural Development that an executing agent should be created (PROPTA) which will furnish COCA with the information necessary to define policy and in turn, once those policies are defined, will be given the responsibility of implementing those policies. TAT will support the creation, installation and organization of PROPTA's program of work. As all international donors supporting animal traction in Togo are members of COCA, TAT does not pretend to underwrite the start-up cost of PROPTA in its entirety. On the contrary, inital commitments have been negotiated by the project design team and other donors (FED, FAC IRBD) to share the support of PROPTA's organization and operations. TAT will support a set of discrete activities to be undertaken by PROPTA:

1. Monitoring and Evaluation: In the push to support national agricultural policy, donors have initiated animal traction programs with little reference to Togolese smallholder farmers, to farm-level economics or to experiences elsewhere in West Africa. This has resulted in a wide diversity of technical packages, equipment packages, credit systems and subsidization policies. One function of PROPTA will be to monitor and evaluate (M&E) the impact of various project extension strategies on farm-level cropping systems, production levels and economics (see Monitoring and Evaluation Annex Twelve). TAT will support PROPTA's Monitoring and Evaluation Unit in designing appropriate and cost-effective methodologies, in assisting various extension projects to implement the M&E methodologies, in collecting and analyzing the incoming information and in making recommendations to COCA.

2. Credit Harmonization: Virtually every individual animal traction project in Togo practices its own system of medium-term credit. The down payment varies (0 to 16,000 CFA), the interest rate differs (0% to 8%), the number of annuities differs (3 to 7) and the level of subsidy on the purchase price differs (0% to 60%). Furthermore, all projects, save one (Project FED Savanes) have chosen to by-pass the National Agricultural Credit Bank (CNCA). TAT will support PROPTA's efforts to devise a standardized system of medium-term credit which appropriately reflects the realities of farm-level economics. In conjunction with CNCA, PROPTA, with TAT support will look to it that all projects which have programmed medium-term credit for the acquisition of animal traction technology administer that medium-term credit program through the national credit institution, CNCA.

3. Training: There is a common consensus among the senior GOT administrative and technical staff and concerned donors that field agents in agricultural extension, veterinary health care and credit administration have not received adequate training in animal traction technology. Instruction in farming system technology in Togo is not related to animal traction. TAT will support PROPTA in developing a series of training programs, or modules, which will assist various extension projects and national institutions in improving the capacity of their field staff to deal adequately with animal traction. The target groups will be village-level, sub-sector and sector-level agents. PROPTA and TAT will not conduct or finance the actual administration of the training courses themselves, but will make the modules availables to projects and institutions to implement.

4. National Animal Supply: TAT will support PROPTA in establishing a nationally coordinated system for supplying work animals to the various animal traction projects in Togo. A national cattle buying center will be established in the north to not only purchase animals locally but also to receive and guarantee animals acquired in neighboring countries. It is readily admitted that the Togolese national herd, as it is currently

constituted, can only meet short-term demands for work animals. TAT will also support the establishment of two pilot herds to investigate possibilities for the improvement of national herd productivity through extensive livestock production practices.

5. Extension Support Activity: The second level of the project-supported activities will occur in the two northern economic regions, Kara and Savanes. For the past three years, a modest AID-funded AIP project for the extension of animal traction in certain areas of the Kara region has been functioning with reasonable success. TAT will continue support to this extension activity. Furthermore, extension activities will expand in the Kara region to other areas not currently covered by other projects, and will open new areas for the extension of animal traction in the Savanes region, also where no other projects are operative. This support to regional-level activities will be channeled through the respective Regional Offices for Rural Development (DRDR's) and will consist of establishing local-level Extension Support Centers (CAT's), providing logistical and technical support to farm localities and of training local-level field staff.

From the preceding brief summary presentation, it can be discerned that TAT is not strictly an agricultural production project. Rather, it has major components of institution building and personnel development. The only activities directly related to production concern the establishment of the ten local-level Extension Support Centers. This is of particular importance when applying any methodologies of economic analysis.

This project will be supporting various institutions in a variety of ways. It will aid in the establishment of PROPTA and the development of its program of work. It will be assisting CNCA in establishing rational systems of medium-term agricultural credit. It will be installing a national system for animal supply. It will be supporting the DRDR's capacity to support the extension of animal traction. Throughout these institutional support activities, TAT will be developing relevant training materials such that the personnel of these various institutions will be capable of carrying out the work. Project supported activities directly related to increase in agricultural production will be limited to these areas of the two northern economic regions which are touched by the Extension Support Centers.

FARM-LEVEL FINANCIAL ANALYSIS

As is true of so many developing countries, reliable farm-level input/output information is virtually non-existant. The national Agri-

cultural Statistics Service was supposed to have carried out annual samples of farm area, yield and production levels since the last general Agricultural Census of 1972-73. However, the two-step sampling methodology used keeps no track of differences in farm-enterprises, but rather reflects the degree of population concentration by biasing the final sample selection towards the larger villages and towns. Furthermore, for as much as five years there have been no field measurements. Rather, surface area has simply been automatically increased by an annual multiplier factor. Finally, none of the current animal traction projects in Togo has based its extension strategies, equipment selection, or cropping systems, much less its economic evaluations of animal traction, on a systematic examination of current farming practices.

These introductory criticisms are presented as a means of demonstrating the need the project design team felt for proposing a phased progression of TAT activities, and for presenting both a farm-level financial analysis and a project-level economic analysis, based on a series of critical assumptions. In the absence of any solid, systematic farm-level information, the project design team was obliged to rely on previous experience in Togo and elsewhere, on extensive discussions with Togolese and expatriate technicians and on field visits with farmers and local-level agents.

1. Representative Cropping Package: The conventional wisdom in Togo argues that the typical amount of land cultivated per family is very small (less than 2 hectares). On the one hand, there is very little solid evidence to support this rule-of-thumb and, on the other hand, given average family size (7 to 9), it is difficult to imagine how families feed themselves, given expected yields. Consequently, the project design team hypothesizes that farm area is in fact somewhat larger and that, where it is not, people must have significant sources of non-farm income. In any case, the extension of animal traction should be directed at smallholder farmers who are fully engaged in farming as a livelihood. It is with these clients in mind that the cropping packages in Tables 7 and 8 are presented. The two packages are presented as rough approximates of what is currently observable. The distinction between a cereal zone and a root crop zone is necessary, given the significant ecological differences north and south of Gando (slightly above 10° North latitude) and also in light of the economic implications of growing a root crop.

2. Yields and Prices: Official reporting of yields and output prices were found to be widely variable and of highly questionable reliability. In compiling the yields and prices used by other projects and studies, wide variability was also observed. In the end, a very rough synthesis of past experiences, field visits and existing data was adapted. For

the purposes of analysis, it was decided to use conservative (i.e. traditional) yield estimates throughout, so as not to overstate the case. Concerning farm-gate prices, approximations of open market prices have been used, as better than 95% of marketable surpluses are sold on the open market.

With the adaption of animal traction, some area and yield effects habe been presumed over time (see Table 5). Within five years, it is expected that the farm adopting animal traction will increase ist cultivated area by 30%. Although, given the existing labor stock and with disposable land, it may be argued that technically there are no constraints to a much more significant expansion, experience elsewhere in West Africa indicates that 30% is more realistic (see Sargent et al).

In this analysis, no other improved inputs besides animal traction (i.e. seed, fertilizer) have been assumed. Here again, the intent is to remain on the conservative side of projected improvements. In the particular case of fertilizers, the very high level of national price subsidies (upwards of 75% of real price) argues that demand for fertilizers has been artificially induced. Two years ago, when the GOT raised the price of fertilizer from 15 CFA/kg to 35 CFA/kg (still a 75% subsidy), effective demand for chemical fertilizers collapsed. Furthermore, supporting such a large price subsidy is feasible for the GOT as long as consumption levels increase significantly. Otherwise, support of the subsidy quickly becomes a difficult financial burden on the national budget, particularly as a hard currency expense.

Despite the lack of any other improved inputs, a yield improvement of 20% over five years has been assumed (Table 5). This is due to more timely planting, better seedbed preparation and the progressive adaption of weeding to animal traction methods.

3. Rural-Urban Prices: For reasons discussed more fully below under Economic Issues, it has been assumed there will be a shift in relative rural-urban prices and that farm-gate prices will increase faster than the general price index. An arbitrary ration of 5:4 has been adopted as the rate of increase in projected prices.

Table 5 presents various combinations of these factors and their changes over time. A composite index has been tabulated for each set of varying assumptions. For the basic analysis, Assumption A has been used while the other sets were used in some sensitivity testing discussed below.

4. Animal Traction Packages: The choice of an animal traction package should properly be the result of a selection of a cropping system and a selection of operations to be performed on those crops. This has not been the case in Togo and projects have tended to deliver a pre-determined set of equipment. It is the project design team's opinion that the initial equipment package should includeonly those tools which will be immediately productive. Table 6 presents a range of different equipment packages and their costs at unsubsidized prices and under different terms of credit.

The difference in the various equipment packages has significant impacts on the level of annual payments. Equipment packages A and G best represent the mixes of equipment actually being used. The principle difference being that in areas where row crops are grown on ridges, package A is used, and in areas where row crops are grown on the flat, package G is used. Combining the ability to do both results in package H. Using identical terms of credit, there are no more differences in the payment levels. For simplicity's sake, package A has been used thoughout, as it falls in-between packages G and H.

5. Credit System: The design team has adopted a medium-term credit system which appears to respond to the projected earning capacity of farmers as well as to the needs and constraints of the national agricultural credit institution. Concerning questions of interest rates and input price subsidies, these are discussed more fully below under Economic Issues. In summary, no input price subsidies have been used and an annual compound interest rate of 8% has been adopted. The official CNCA interest rate for medium-term agricultural loans is 13%. On the one hand, those projects which do apply an interest rate to the animal traction package are currently using 8%. On the other hand, given the GOT and IMF policies of shifting priorities away from the commercial and industrial sectors and towards the agricultural sector, the design team feels that a subsidized interest rate would be an appropriate indirect subsidy in favor of the agricultural sector.

It is also felt that some sort of down payment should be expected from potential adopters as a sign of commitment. A figure of 10% has been used, although at 5% there are no major impacts on the level of annual payment. It should be noted that in the analysis, the down payment has been charged against first year revenues, while in fact, it would be more accurate to charge the down payment against the previous year's income.

One component of the equipment package automatically included by all current projects is the 2-wheel cart. This item more than doubles the cost of the equipment package and hence, its ability to generate revenues and pay for itself is all the more important. The cart adds

16,000 CFA to the annual payments. The ability of a particular farmer to generate such additional revenues will depend on some fairly restrictive pre-conditions. The surrounding topography of the farmland within a radius of about 30 kilometers will determine whether animal-drawn transport is feasible or not. In the areas surrounding Kara, Niamtougou, etc., animal-drawn transport is doubtful at best. Secondly, even if the surrounding topography is conducive to animal-drawn transport, the first few carts in a local area will find themselves in a supplier's market. However, the fifteenth or twentieth cart may find the market for transport services saturated. This discussion seeks to further emphasize that the selection of the tools which compose the equipment package, and in particular the cart, must be determined as a function of local conditions and the individual farmer's ability to repay his loan. In the analysis and in the initial equipment package, the cart has not been included.

6. Animal Health and Insurance: The purchase of two draft animals represents the largest single cost item in adopting animal traction and, quite obviously, without animals there would be no animal traction. It is thus extremely important to protect this investment and the farmer's liability. Over the past few years, there has been a growing recognition in Togo of the need for this protection. However, to the extent that insurance schemes have been implemented, they have been done in a fairly *ad hoc* fashion. As part of the initial package, TAT is proposing a program of linked animal health care and animal insurance, at least for those farmers which the project is assisting directly.

This insurance scheme will insist that the farmer respect certain preconditions in order to benefit from the plan. Farmers will be expected to construct a simple stable, keep it clean and initiate on-farm measures to provide dry season food. They will also be expected to purchase annual health cards for each animal. These cards will allow project officers to determine whether farmers are negligent in animal health care or whether the Veterinary Service is negligent in performing its responsibilities. The cost of these health cards will be 1000 CFA/animal/year. They cover the standard set of annual veterinary interventions.

It would be unfair to calculate insurance premiums on the basis of the current population of work animals and the current ability to deliver veterinary services to animal traction farmers. If we assume 5,000 working animals (2,500 pairs) at 75.000CFA per animal and a 3.5% mortality rate, the annual insurance premium per farmer would be about 5,000 CFA per year. For the various analyses, an annual cost of 7,000 CFA has been adopted as the cost of animal health care and insurance.

7. Time Frames: Among other reasons, the credit system is based on a five-year period because it is felt that the oxen will have an expected work-life of 5 years before they should be sold off for meat. If the animals are acquired at 2 1/2 to 3 years old, they can be expected to gain weight until they are 6 or 7, particularly if they benefit from improved health care and dry season maintenance. It is hypothesized that farmers will hold on to work animals for some time after the animals' weight has peaked, namely because they will be well-trained and well experienced as draft animals and then at their most productive peak. However, any efforts or costs in feeding animals at this point will have become a weight-maintenance activity, as the animals will be gaining no further weight. Consequently, for the analysis, a work-life expectancy of 5 years has been used.

It has been assumed that the major components of the equipment package will have a life expectancy of 10 years. This is further based on the assumption that farmers will keep the working pieces in good condition and/or replaced when necessary.

In the financial analysis, there is another assumption concerning impacts over time related to learning functions. The farmer-adopter will have to learn how to manipulate a new farm technology and integrate it into the overall management of the farm. Built into the assumptions concerning farm production and productivity are time lags which allow for this learning function. Furthermore, although there is substantial evidence that the practical production and productivity improvements from the use of animal traction are much higher that what has been hypothesized here, using such potential improvement figures has led other projects in Togo and elsewhere in Africa to seriously overstate the case for animal traction. Exaggerating the potential farm benefits from the adoption of animal traction often leads, among other design problems, to over-equipping of farms and to terms of medium-credit which are beyond the realistic capacity of the farmer to meet. Consequently, the design team has used modest productivity and production improvement figures and has also discontinued any further improvements after year five. If TAT and the appropriate national institutions enjoy any success at improving the farm management counseling skills of field personnel, it might be argued that production and productivity improvements would continue beyond year five and would reach levels higher than those presented here. However, the history of animal traction projects in West Africa demonstrates one very clear common characteristic, that the project designs have consistently been overly optimistic concerning potential benefits to farmers.

8. Implications of the Analysis: This analysis treats the costs and benefits of adopting the use of animal traction from the point of view of the farmer-adopter. The one major distortion between the analysis presented here and what farmers are actually confronted with in Togo today, concerns the cost of this package. This analysis has used the

real cost of equipment, while all projects in Togo are using some level of input price subsidy. The design team felt that given adequate extension, training and support services (the other major objectives of TAT) ,such subsidies are not only unnecessary, but also distract farmer management functions and potentially could place an unacceptable burden on the national budget. As a purely indicative example, if 40% of the farm families in only the two northern regions were to adopt animal traction and they benefit from a 50% input price subsidy, the cost to the national budget would amount to 10% of the total planned investment in rural development called for in the Fourth Five-Year Plan (1981-86).

Tables 11 and 12 present farm cash flow for farmers which adopt animal traction and indicate the value added attributable to the adoption of animal traction. In the cereal crop zone, the adopter nets an average of 8% per year over and above what he would earn during the same period without animal traction. In the root crop zone, the adopter nets an average of 6%above what he would earn without animal traction. If the cost and benefit flows are carried over 10 years, the average rate of growth in value-earnings slows somewhat largely because further improvements in productivity and gross production are discontinued after year five.

In the analyses presented by other current projects in Togo, they have all consistently mishandled the role beef production plays in a farming system based on the use of animal traction. At the worst (Projet Vivrier-Entente Fund), the argument is made that the animals are actually worth less after five years work than when they purchased and at the best, others argue that animals are worth the same as when they were bought.

As is argued throughout this Project Paper, the introduction of animal traction technology into the agricultural system entails adjustments throughout the system. One basic pre-condition of being able to use animal traction technology is the on-farm husbandry of large animals. As in this case those large animals are beef cattle, benefits are derived from a joint-product enterprise. There are the benefits derived from a new on-farm source of energy for field crop operations, and the benefits derived from an on-farm source of beef production. As a general rule-of-thumb in the African context, animal traction oxen at least double in value over five years. In the analyses presented here, this has been incorporated into the benefit flow as 100.000 CFA in the fifth year for the two animals, which represents 90% of their purchase value. Given the comparable volumes of cash flows, this joint-product benefit is most significant to the farmer in the cereal crop zones, accounting for 40% of the cumulative 5-year benefit stream and slightly more than 20% of the cumulative 10-year benefit stream.

To aggregate these farm-level benefit streams to total project benefit streams, the design team has assumed that 100 farms will adopt animal traction each year. Given the different degrees of familiarity with animal traction among the farming populations and the different degrees of land availability, 60 of these farms will be in the cereal crop zone and 40 in the root crop zone.

Tables 18 and 19 present the aggregated benefit streams from year one to year fifteen. Fifteen years have been chosen so that the last adopters during the TAT project life can be followed through the 10 years of equipment life. It has also been assumed that the earlier adopters will continue to use animal traction and will reinvest in new equipment. These costs have been deducted from the benefit stream.

2. Project Costs: Tables 15 and 16 present the division of AID and GOT costs between institution building and personnel training (PROPTA) and extension support (DRDR). The parenthesis following each of the line-items indicates the percentage of a particular cost item attributable to PROPTA and the percentage attributable to the DRDR's. The design team feels it is inappropriate to charge the costs of Technical Assistance to an analysis of project costs and benefits. On the one hand, approximately 30% of Technical Assistance cost can be directly attributable to the DRDR's and on the other hand, their role is essentially institution building, personnel training and the progressive formulation of more appropriate and responsive farming system prototypes based on the use of animal traction. It may be argued that these functions have direct influence on production but the intention would be to influence production on a national scale in all projects and all regions. The design team argues that the costs of Technical Assistance should be treated as are most development costs and should not be charged, wholly or in part, to the TAT extension support activity.

The other cost items are fairly self-explanatory. The attribution of costs has been distributed evenly over the years in which the particular hire items occur. Construction investments have been depreciated over 20 years. The Revolving Funds have been given a life expectancy of 20 years (i.e. 5% disappears each year), however, the design objective is, of course, that it be self-perpetuating.

Concerning GOT contributions (Table 17), as AID contributions phase out at 5 1/2 years, GOT will have to pick up some of the vehicle and operating costs. Fairly generous levels of vehicle expenditures ($20,000/yr) and of operating costs ($50,000/yr) have been programmed as a conservative measure.

3. Discounted Measures of Project Worth: The resulting benefit and cost streams are summarized in Table 20. In the economic analysis, no inflation factors have been used, as they are assumed to apply equally to costs and to benefits. Given the nature of the two streams, inflation

The discussions of assumptions underlying this farm-level financial analysis have explained how and why the design team has attempted to remain on the conservative side of projected benefits and yet charge the real financial cost. The purpose is to avoid overstating the case for animal traction. The results of the cash-flow analysis indicate that animal traction does represent a real potential productive input to smallholder farmer operations for the improvement of farm productivity, production and incomes.

PROJECT-LEVEL ECONOMIC ANALYSIS

Given the mix of objectives and the configuration of activities supported by TAT, it is at best problematic to attempt a complete comparison of project benefit and cost streams. As an example, TAT will be underlying the installation cost of a national system for acquiring and distributing work animals. In that most of the animals will be delivered to projects other than the TAT extension support activity, the question then becomes, what proportion of the benefit generated by these work animals delivered to other projects by TAT should be attributed to investment costs incurred by TAT? Whether one uses 10%, 25% or 50%, the economic analyses would remain arbitrary at best, if not an exercise in creative economics. A similar argument is applicable to TAT support to various training activities. The clients for training have job responsibilities which include but are not limited to supporting animal traction technology. What portion of their skills and consequent productivity can be attributed to TAT investments?

Because TAT is an implementation project with multiple objectives, only one of which is direct production, and because of the methodological problems discussed above, the design team has decided to separate out those project costs directly attributable to the extension support activity which have direct impacts on a production and income objective.

1. Project Benefits: Tables 13 and 14 present the estimated economic benefit streams for farmers in both cropping zones. The adjustments which have been made in these presentations as compared to the financial analysis are footnoted, in part, in the Tables. However, there are some further comments to be made.

As discussed earlier, benefits are assumed to remain constant after year 5. Given the assumptions made regarding relative rural-urban prices, the miscellaneous farm inputs will not change in price relative to farm output prices. However, the animal traction package J, used in these presentations, reflects an average equipment cost over the project's life. After the initial package has been repaid (year five), a cost item has been introduced to maintain the equipment through its 10 years of expected life. It has also been assumed that the working animals will finance their own replacements and the value-added from beef production has been attributed equally by year for the work life of the animals.

would inordinately favor the benefit stream. In Table 20, the results of two different discounted measures are shown: an Internal Rate of Return (IRR) calculation and a Benefit/Cost Ratio calculation. Relying on Benefit/Cost Ratios requires the fairly arbitrary choice of a discount rate. There are arguments for and against any one choice of a discount rate. As can be seen from the results presented, if benefit and cost streams are run long enough, eventually the ratio will become attractive. For reasons discussed earlier, a 15-year time frame has been adopted for benefits attributable to project investment costs.

The design team has opted for an Internal Rate of Return calculation, particularly because it avoids the problem of arbitrarily selecting a discount rate. The methodology for estimating the IRR was adopted from J.P.Gittinger, Economic Analysis of Agricultural Projects John Hopkins, 1979. Over 15 years, the TAT extension support activity will generate an internal economic rate of return of 10%.

The significance of this IRR deserves some comment. Consistently, throughout the development of this analysis, estimations of both benefits and costs have been conservative. That is to say that estimates of benefits have been low and estimates of costs have been high. The standard theoretical criterium for project selection is that the IRR should be, at a minimum, equal to the opportunity cost of capital. First, one must determine the economic opportunity cost of capital, but then it must also be determined that, in the current political-economic climate of Togo, such an economic opportunity cost of capital is an appropriate criterium for project selection.

Should the economic cost of capital be estimated, say, at 16%, it would certainly be possible to adjust the benefit and cost streams such that the project IRR obtains a minimum of 16%. This has not been the objective of the design team. Furthermore, the history of public investments in Togo has consistently awarded inordinate advantages to the non-agricultural sectors. This is the mutual conclusion of the GOT and the IMF, and it witnesses a readiness to shift the public investment portfolio towards conferring a higher priority to investment in agriculture. Consequently, short and medium-term returns to investments in agriculture can be agreed to be worth more than their quantified value.

It is the conclusion of the design team that the economic rate of return calculation of 10% indicates that the AID investment in TAT represents a potentially productive activity which will contribute to improved production and income in the Togolese agricultural sector.

ECONOMIC ISSUES

The preceding financial and economic analyses have touched a number of economic issues which are more macro-economic in character and any one implementation project may have little opportunity to influence them greatly. However, the multi-faceted nature of TAT's objectives as well as the existence of a national policy making committee (COCA) warrant that these issues be addessed in the context of this project and that basic orientations regarding these issues be incorporated into the basic design document. Various ones of these issues have been referred to in the preceding analyses when their impact was direct to the specific concern. The following discussions are presented more as a point of general concern, and policy directions are suggested as supportive of animal traction in general and of this project's objectives in particular.

1. Agricultural Pricing Policies: As is true of most developing countries where dominant occupations are agricultural, public policy makers in Togo are constantly trading off cheap consumer food prices versus remunerative farm-gate prices. The artificial suppression of farm-gate prices is very likely one of the most effective methods for slowing the growth rate of the agricultural sector.

Recent developments in the Togolese economy give rise to the hypothesis that the relationship between rural and urban prices may be changing in the short to medium-term in favor of the rural, agricultural sector. The past ten years of public investment history have placed a singular emphasis on the industrial and commercial sectors. During the same period, phosphate prices have been unstable and falling. In the late 1970's,national debt service payments grew alarming. In 1980-81, as part of the negotiations to reschedule the support loans, IMF and GOT agreed to de-emphasize the industrial and commercial sectors, construction and tourism in particular, and accord a greater priority to food self-suffiency and the growth of the agricultural sector in general.

During the same 10 year period, attempts were also made to industrialize agriculture primarily through the introduction of a large number of motorized tractors (a hard currency GOT purchase) made available on a rental basis to producers. Given the lack of any support and maintenance, infrastructure or skills, and given that as much as 80% of the population operate small farms, the tractor scheme failed and was extremely costly to the economy. The official reaction to this experience has been very frank and become a matter of public record. The new orientation recognizes that agricultural production in Togo is the production of smallholder farm operators and that improvements must be defined in terms of these small farms. The promotion of animal traction is an integral component of this policy orientation.

In this public policy climate, it can be argued that, relative to urban prices, rural farm-gate prices will improve. This conclusion has been explicitly incorporated into the estimates of benefit streams.

2. Agricultural Marketing: It is straightforward corollary that the prices farmers receive are influenced not only by agricultural pricing policies but also by marketing conditions. As a policy position, the GOT affirms that it, in no way, seeks to put a ceiling on farm-gate prices. In point of fact, the vast majority of marketable surpluses are traded on the open market with no interference from the government.

Togo has no tradition of government marketing boards for food crops. However, there have been attempts on the part of the government to establish strategic reserves. The purpose of these reserves has been to (1) supply deficit areas with food, (2) supply urban concentrations and (3) dampen seasonal fluctuations of food prices. The current government institution, TOGOGRAIN, has been fraught with mismanagement and economic inefficiency. Its official policy argues that it is only interested in delivering reasonable priced food stuffs to deficit areas (rural and urban) but that it seeks in no way to influence the producer prices. Nevertheless, in its purchasing activities, TOGOGRAIN is assisted by local political and administrative officers in acquiring food stuffs. This assistance consists largely of political persuasion and appealing to the producers' sense of public responsibility. It is not clear that those producers who do sell to TOGOGRAIN receive significantly lower prices than they would on the open market, particularly given the time of the year when they sell (at harvest and shortly thereafter).

The most important fact concerning TOGOGRAIN operations is that it controls less than 3% of the marketable surplus and does not represent any significant force in the food commodity market. It should be noted, however, that TOGOGRAIN's long-run theoretical objective is to contract as much as 50% of the marketable surpluses. Given TOGOGRAIN's current condition and its management capacity, it is extremely unlikely this will occur. Nevertheless, it is the opinion of the design team that any government institution set up to ensure transfers from farm surplus to deficit areas and/or to create strategic food reserves should compete in the open market for food supplies.

3. Agricultural Input Prices and Subsidization: The long run soundness of improvements in agricultural production will ultimately rely on real economic conditions. Togo has pursued a policy for some time of heavily subsidizing agricultural inputs (improved seed, fertilizers, tractor rentals, animal traction). Reasons for this policy are likely two-fold. On the one hand, the argument is often made that in order to persuade a farmer to accept an innovation, its real costs

must be subsidized in the early years. The argument goes on to assert that once the innovation has been adopted and the farmer has experienced its utility, he will be prepared to pay the real costs of the innovation. Such a position seriously underestimates the price responsiveness of small farmers. In recent Togo history, there are two examples of changes in input price subsidies and the direct price responsiveness of farmers. From 1978 to 1979, the tractor rental rate went from 3,000 CFA to 12,000 CFA per hectare (still a 50% subsidy) and small farmers were priced out of the market. From 1980 to 1981, the price of fertilizers went from 15 CFA to 35 CFA and the consumption of fertilizers dropped sharply. Direct input price subsidies disturb the bases on which farmers make their management decisions and lead farmers into awarding an unrealistic productivity to a particular input. The bases for recommending an agricultural innovation should be rooted in sound economic reasoning and if, in fact, this is the case, it should be presented to the farmer as such.

On the other hand, direct input price subsidies are also defended as a trade-off to make up for suppression of output prices. It is argued that particularly the economy must deliver cheap food to urban consumers, and in order to protect producer margins, must concurrently provide direct subsidies of input prices. Such reasoning sidesteps the basic economic principle of scarity and price. In the absence of government control, the high speculative consumer prices are the result of scarity of supply. If the government's objective is to see food available to consumers at reasonable prices, the most obvious means to this is to provide producers with adequate incentives. Probably the strongest single production incentive is producer price.

The current policy of all animal traction projects in Togo is to allow from a 30% to 60% subsidy on the equipment. In these analyses, the design team has used no direct subsidies on input prices. It has been argued that they are not only not desirable as policy but also not necessary economically. However, as TAT represents only one of many efforts in Togo to promote animal traction, it is unrealistic to remove all subsidies overnight. In the first instance, TAT will conform to current national policies and provide a 40% subsidy on the equipment price. At the same time, TAT will be presenting arguments and compiling evidence that such subsidies should be reduced and subsequently removed as soon as possible.

On issues concerning subsidy policices, the distinction should be made between direct and indirect input price subsidies. As an example, the delivery of veterinary services consists of drugs, equipment, personnel, administrative and logistical support. A subsidy on the drugs would be a direct price subsidy, while a subsidy on other delivery costs would be an indirect subsidy. This project will be charging the farmer the real cost of veterinary drugs but will not be asking him to pay a portion of the veterinarian's salary, etc. As has been

discussed above, direct input price subsidies run too great a risk of distorting a farmer's financial analysis and consequent management decisions. Indirect input price subsidies, on the other hand, represent a legitimate mechanism by which public policy can implement economic transfers in support of those policies. In the particular case of Togo, such transfers support the public policy of according a higher investment priority to the agricultural sector.

4. Agricultural Credit: The medium-term credit package to be used by TAT has been outlined earlier in this annex. This project will be administering its credit program through the national credit institution, CNCA, and in its work with PROPTA, urging that all animal traction projects do the same. The CNCA is the national institution for agricultural credit and is mandated by legal statute to administer all credit programs related to rural development. To date, virtually all other animal traction projects have chosen to by-pass this institution and administer their own credit programs on their own terms.

The 5-year credit program adopted by TAT conforms to the standard terms of CNCA'a medium-term credit policies. The one point for discussion is the choice of the interest rate. Currently, those projects which are charging an interest rate are using 8%. Initial recommendations currently under discussion for a national, standardized medium-term credit system for animal traction include an interest rate of 8%. Technically, for such loans, CNCA's official interest rate is 13%.

TAT has adopted an interest rate of 8% to conform with the current credit terms of other projects and with current national policy vis-a-vis animal traction. Furthermore, in the past, the industrial and commercial sectors have benefited from preferential interest rates. With the shift of investment priorities to the agricultural sector, it can be argued that a subsidized interest rate is a legitimate indirect subsidy to the acquisition cost of animal traction technology.

5. Technical Package and Equipment Selection: Animal traction technology should be perceived of as a tool to do a job. It follows then that it is indispensable to first define the job to be done before selecting the animal traction equipment a farmer should acquire and use. It appears that this has not been the reasoning used in the past, but rather the equipment was selected with little reference to the farm enterprise package. This has resulted in the overequipping of farmers, high levels of indebtedness, low rates of repayment and underutilized tools.

In point of fact, a fully articulated farming package using animal traction has not been developed for the growing conditions in Togo. The design team has proposed a minimum equipment package and has written into TAT's plan of work the progressive development and definition of agronomic and economic constraints to a fully-integrated farming system appropriate to agricultural realities in Togo. Many diverse elements of such a system are known and are practiced to varying degrees in Togo, but no effort has yet been made to compile what is known and what is not known. Much of TAT's work within PROPTA will be to more fully define and develop the appropriate farming systems. As these are developed, the selection of equipment becomes more and more self-evident.

6. Recurrent Costs: The design of TAT does not place significant additional recurrent cost burdens on the GOT budget. The main reason for this is that the project is creating very few new personnel positions. The vast majority of Togolese project staff called for are already government staff members and technicians. As national policy places increasing emphasis on the promotion of animal traction, it is reasonable that the GOT reorient the job responsibilities of its personnel.

The most important cost item which might be claimed as a recurrent expense due to this project would be the rolling stock and its operating costs. Other items would be the operating costs of the animal buying center at Tantiegou, operating costs of the intermediate center at Agbassa and the continuation of certain activities within PROPTA. All together, these recurrent costs might amount to approximately $ 300,000 per year. However, it should be noted that in the long run, as the demand for work animals becomed stronger and more widespread, it is believed that private sources of animal supply will satisfy an increasing proportion of the demand. Finally, besides supplying work animals and factoring the cost of that service into the price of the animals, as is currently done, PROPTA will increasingly become a deliverer (for a price) of other services (training modules, monitoring and evaluation methodologies). In the long run, PROPTA will be factoring in its overhead costs as part of the price of these services. On an economic basis, even modest estimations of benefit streams can easily more than compensate for this level of recurrent costs.

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ANNEX TWO

ECONOMIC ANALYSIS

Appendix 1 : BASIC INPUT DATA

Table 1 : Demographic Characteristics - 1980
Table 2 : Farm Gate Prices
Table 3 : Average Yields
Table 4 : Production Input Prices - 1982
Table 5 : Assumptions Concerning Yields, Areas and Relative Rural-Urban Prices
Table 6 : Animal Traction Packages and Terms of Credit

Table 1 : Demographic Characteristics - 1980

REGION	KARA						SAVANES	
PREFECTURE	KERAN	KOZAH	DOUFELGOU	BINAH	BASSAR	ASSOLI	TONE	OTI
Population	44,800	120,900	66,100	50,100	118,300	22,400	249,100	77,700
Area (km^2)	1,660	1,075	1,275	480	6,100	?	4,570	3,900
Density (pop/km^2)	27	112	52	104	19	?	55	20
# Households	6,400	17,270	11,020	7,160	14,790	2,240	22,650	11,100
Pop/household	7	7	6	7	8	10	11	7
Workers/household	4	4	3.5	4	5	6	6.5	4

Sources: (a) Zachariah and Nair, "Togo: External and Internal Migration", Demographic Aspects of Migration, Volume 2, World Bank.

(b) Togo. Direction de la Statistique, Resultats Provisoires du Recensement General de la Population et de l'Habitat, Ministere du Plan, Novembre, 1981.

(c) Togo. Direction des Enquetes et Statistiques Agricoles, Enquete Agricole: Recensement General de l'Agriculture - Campagnes 1972-73 et 1973-74. Ministere du Developpement Rural, Mars, 1976.

TABLE 2 : FARM GATE PRICES (CFA/kg)[1]

SOURCE	SORGHUM	MILLET	MAIZE	YAMS	CASSAVA	COWPEAS	BEANS	PEANUTS	RICE	COTTON
SARGENT, 1978	50	49	60	-	-	-	73	52	45	60
WORLD BANK, 1980	40	40	40	30	15	-	55	100	50	60
D.A.I., 1981	50	-	-	30	-	112.5	-	66	-	-
PROJET VIVRIER, 1981	60	60	50	25	25	-	80	55	50	60
NORD-TOGO, 1982	55	55	60	-	-	-	-	60	80	60
GTZ 1982	60	-	60	-	11.5	130	-	70	70	65
DRDR-Savanes, 1982	85	-	85	-	-	-	140	65	60	65
SARGENT, 1982[2]	60	60	60	30	12	130	130	70	70	65

[1]As can be seen from the various source material presented in this Table, no one appears to be systmatically monitoring producer prices. Official pricing policies are sporadically applied. The GOT Agricultural Statistics Bureau does monitor prices, but the most recent report available is 1978.

[2]These are the prices that have been adopted by the Project Design Team. They are the result of examinations of the various source materials and methodologies used, site visits and discussions with participants throughout the marketing and production chains.

TABLE 3 : AVERAGE YIELDS (kg/ha)[1]

SOURCE										
TRADITIONAL METHODS	SORGHUM	MILLET	MAIZE	YAMS	CASSAVA	COWPEAS	BEANS	PEANUTS	RICE	COTTON
SARGENT, 1978	588	382	-	-	-	-	142	392	900	600
DAI, 1981	765	539	800	10,000	-	300	300	570	775	635
PROJET VIVRIER, 1981	500	500	850	10,000	7,500	-	400	950	850	-
NORD-TOGO, 1982	875	-	2,207	14,027	-	-	-	1,393	675	-
SARGENT, 1982 [2]	680	470	825	10,000	4,000	300	300	570	775	635
IMPROVED METHOD[3]										
DIA, 1981	800	650	900	10,000	-	400	-	500	-	650
PROJET VIVRIER, 1981	1,000	800	1,500	10,000	7,500	-	600	1,200	1,200	900
NORD-TOGO, 1982	-	-	2,471	-	-	-	-	1,800	2,457	-
GTZ, 1982	800	-	1,700	-	3,300	800	-	1,000	2,000	1,000
SARGENT, 1982[2]	870	725	1,400	12,000	5,000	600	600	900	1,600	850

1 The TAT project area extends over differing soil, rainfall and other growing conditions. Besides, the various other projects have widely different methodologies for data collection and place little importance on monitoring the effects of project interventions. Consequently, it is extremely difficult to accept or reject any one set of estimated average yields.

2 The average yields adopted by the project design team reflect a synthesis of existing data, site visits, interviews and research results from other similar agro-climatic zones in West Africa.

3 The difference between traditional and improved methods varies not only among the various projects but also in the uniformity with which a particular package is applied. The most can be said regarding the packages referred to in Table 3 is that "improved" usually involves some improved seed, fertilizer and some animal traction interventions.

Table 4 : PRODUCTION INPUT PRICES - 1982

SEED VARIETIES (CFA/kg)[1]	LOCAL	IMPROVED
Sorghum - 15 kg/ha	60	85
Millet - 8 kg/ha	60	85
Maize - 25 kg/ha	60	90
Yams - 1,000 kg/ha	30	-
Manioc - 7,000 cuttings	1.5	-
Cowpeas - 15 kg/ha	130	150
Beans - 40 kg/ha	130	150
Peanuts - 80 kg/ha	70	130
Rice - 80 kg/ha	70	80
Cotton - 25 kg/ha	-	130

FERTILIZERS, INSECTICIDES[2]	FINANCIAL	ECONOMIC
NPKSB (CFA/kg)	45	150
15-15-15 "	35	130
UREA "	35	130
TRIPLE SUPER PHOSPHATE "	35	130
COWPEA INSECT TREATMENT/ha	4,000	?
Actelic - 1 sachet/300 kg	125	?

ANIMAL TRACTION DRAFT TEAM[3]	
ANIMAL	55,000
YOKE	5,000
NOSE RINGS (2)	700
CHAINS	
TETHER ROPES (2)	1,700
HEALTH CARD/YR	2,000
INSURANCE/YR	5,000

1 Local seed varieties are priced at market producer prices. Improved seed varieties are priced at either actual prices practiced in Togo or at C.I.F. approximations. A shadow-pricing exercise to reveal hidden or indirect subsidies would significantly raise these prices.

2 Economic prices for fertilizers are approximations of current world prices, C.I.F. Lome. They do not include in-country handling and transport costs.

3 Current market prices.

Table 4 (cont.)

ANIMAL TRACTION EQUIPMENT[4]

PART	ASSEMBLED	SEMI-ASSEMBLED	NON-ASSEMBLED
M9-5 Multi Purpose Tool Bar	65,390	56,730	-
CH-9 Plow 9"	30,780	25,770	-
H5-S 5-Teeth Weeder	27,170	23,770	
BHV Ridger	7,540	7,250	-
M-33 Chisel-tooth Adaptors	1,030	-	-
ER- 2 x 15 Harrow (15-Teeth)	21,560	-	-
GP 1000 Cart (1000 kg)	70,060	68,580	63,350

VARIOUS SPARE PARTS:

9" Plowshare	3,620
9" Plowheel	540
Plow Wheel Bushing	810
Ridger Point	785
Wrench 17/22	755

VETERINARY SUPPLIES[5]	CFA/HEAD/TREATMENT
Berenil 2,250 CFA/10 Head	225
Tibenzol	150
Exene 6,000 CFA/100 doses	60
Panacur 130 CFA/150 kg weight of animal	260
Vaccines	
Rinderpest 350 CFA/50 Head	7
Anthrax 800 CFA/40 Head	20
Pastuerollsin 250 CFA/10 Head	25
Tigale 3,200 CFA/litre	8
Supona 4,250 CFA/2 litres	5

4 Manufacturer's prices, UPROMA, Kara.

5 Current market prices practices by Togo Veterinary Service, Kara.

Table 5 : ASSUMPTIONS CONCERNING YIELDS[1], AREAS[2] AND RELATIVE RURAL - URBAN PRICES[3]

(in percentage)

	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 7	YR 8	YR 9	YR 10
ASSUMPTIONS: YIELDS	100	105	110	115	120	120	120	120	120	120
AREAS	100	110	120	125	130	130	130	130	130	130
PRICES	100	103	107	112	118	118	118	118	118	118
GROSS VALUE INDEX A[4]	100	119	141	161	184	184	184	184	184	184
ASSUMPTIONS: YIELDS	100									
AREAS	100									
PRICES	100 →									
GROSS VALUE INDEX B	100	100	100	100	100	100	100	100	100	100
ASSUMPTIONS : YIELDS	100	100	100	100	100					
AREAS	100	110	120	125	130					
PRICES	100	103	107	112	118 →					
GROSS VALUE INDEX C	100	113	128	140	153	153	153	153	153	153
ASSUMPTIONS: YIELDS	100	105	110	115	120					
AREAS	100	100	100	100	100					
PRICES	100	103	107	112	118 →					
GROSS VALUE INDEX D	100	108	118	129	142	142	142	142	142	142
ASSUMPTIONS: YIELDS	100	105	110	115	120					
AREAS	100	110	120	125	130					
PRICES	100	100	100	100	100 →					
GROSS VALUE INDEX E	100	116	132	144	156	156	156	156	156	156

Footnotes to Table 5

1 Throughout the economic analysis, the project design team has assumed no changes in seed variety or in fertilizer use. The changes in hypothesized productivity are due solely to the introduction of animal traction technology. Through better seedbed preparation, better weeding and better timing of field operations, eventual maximum increases of 20% have been hypothesized.

2 Increases in area cultivated due to the introduction of ANTRAC have been generally over-stated in West Africa, as they are by most current projects in Togo. The project design team has adopted a maximum potential area increase of 30%. (Reference: Sargent, et al.)

3 The index for changes in relative rural-urban prices is an attempt to reflect current national policies. GOT has adopted macro-economic orientations to move its investment priorities from the industrial and commercial sectors to the agricultural sector. This policy shift also reflects the International Monetary Fund's considerations in renegotiating the support loan. The design team has adopted a ration of 5 to 4 in favor of rural output prices.

4 The various Gross Value indices are the multiplier factors by which Gross Farm Product Value changes each year, based on differing assumptions concerning yields, areas and rural-urban prices.

Table 6 : ANIMAL TRACTION PACKAGES AND TERMS OF CREDIT

Package A:

Animals	110.000
Yoke, Rope, Rings	10.000
Tool Bar (Plow, Ridger, Weeder)	66.000
Basic AnTrac Package A	186.000
Animal Insurance/Pair/Year	5.000
Health Cards/Pair/Year	2.000
Direct Subsidies (none)	-
Down Payment (10% of 186.000)	18.600
Interest Rate (8% compound)	
5 Annuities	
(0.2504 of 167.400 plus 7.000/yr)	48.920

Package B:

Package A	186.000
Plus 2-wheel ox cart	71.000
AnTrac Package B	257.000
Insurance and Health Cards	7.000
Direct Subsidies (none)	-
Down Payment (10% of 257.000)	25.700
Interest Rate (8% compound)	
5 Annuities	
(0.2504 of 231.300 plus 7.000/yr)	64.920

Table 6 (cont)

ANIMAL TRACTION PACKAGES AND TERMS OF CREDIT

Package C:

Package A with	
Down Payment (5% of 186.000)	9.300
5 Annuities at 8%	
(0.2504 of 176.700 plus 7.000/yr)	51.250

Package D:

Package B with	
Down Payment (5% of 257.000)	12.850
5 Annuities at 8%	
(0.2504 of 244.150 plus 7.000/yr)	68.135

Package E:

Package A at 13% interest	
Down Payment (10% of 186.000)	18.600
5 Annuities	
(0.2842 of 167.400 plus 7.000/yr)	54.570

Package F:

Package B at 13% interest	
Down Payment	25.700
5 Annuities	
(0.2842 of 231.300 plus 7.000/yr)	72.735

Package G:

Animals, Yoke, Rings, Rope, etc.	120.000
Tool Bar (plow, harrow, weeder)	60.000
AnTrac Package G	180.000
Down Payment (10% of 180.000)	18.000
5 Annuities at 8% interest	
(0.2504 of 162.000 plus 7.000/year	47.565

Table 6 (cont)

Package H:

Animals, etc.	120.000
Tool bar (plow, ridger, harrow, weeder)	87.000
AnTrac Package H	207.000
Down Payment (10% of 207.000)	20.700
5 Annuities at 8% interest (0.2504 of 186.300 plus 7.000/yr)	53.650

Package I:

Package H	207.000
plus 2-wheel ox cart	71.000
AnTrac Package H	278.000
Down Payment (10% of 278.000)	27.800
5 Annuities at 8% interest (0.2504 of 250.200 plus 7.000/yr)	69.650

Package J:

Animals (2)	150.000
Yoke, etc.	15.000
Equipment	75.000
Basic AnTrac Package J	240.000
Direct subsidies (none)	
Down Payment (10%)	24.000
Interest rate (8%)	
5 Annuities (plus 7.000/yr)	61.000

ANNEX TWO ECONOMIC ANALYSIS

APPENDIX 2 : FARM LEVEL FINANCIAL ANALYSIS

Table 7 : Cropping Package for the Cereals Zone

Table 8 : Cropping Package for the Root Crops Zone

Table 9 : Representative Farm Budget for Cereals Zone

Table 10 : Representative Farm Budget for Root Crops Zone

Table 11 : Financial Farm Budget for Cereals Zone with Introduction of Animal Traction

Table 12 : Financial Farm Budget for Root Crops Zone with Introduction of Animal Traction

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Table 7 : CROPPING PACKAGE FOR THE CEREALS ZONE*
(From near Gando north to Upper Volta)

CROP/INTERCROP	SERVICE AREA (hectares)
1. Bulrush millet with a cowpea intercrop	0.7
2. Sorghum intercropped with 4-6 month millet	2.0
3. Maize	0.3
4. Peanuts	0.4
5. Cotton	0.3
6. Rice	0.3
TOTAL	4.0

NOTES:

*While most of the cereal zone falls below marginal rainfall for yams, it has good climatic conditions for cassava production. However, cassava becomes a household garden crop for most of the Savanes region above Gando. The reason given by most farmers and field staff was that during the dry season both domestic stock and wildlife consume the tuberous roots and foliage, which implies the need for expensive fencing if cassava cultivation is to succeed.

1. In some parts of the cereal zone, double cropping is attempted with 4-month millet and transplanted sorghum following the early 60-day millet crop.
2. Sorghum fields, particularly those planted late, will contain a range of cultivar maturities, as well as the millet intercrop. Staggered planting is also common. These practices can be seen as accomodating the high rainfall variation in the zone. No attempt is made here to factor these practices into the economic analysis.
3. Maize use is similar to that further south, but a larger proportion of the crop is grown and stored as dried grain.
4. SOTOCO farmers average about 0.50 hectares of cotton. This figure was discounted to obtain an average figure for the zone.
5. The cereals zone possesses many valleys and water courses, especially in its eastern and southern reaches. As these are areas of concentration for the planned Savanes extension effort, rice is included in the farm model. In drier parts of the zone this surface area would be occupied by other cereals.

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Table 8 : CROPPING PACKAGE FOR THE ROOT CROPS AREA
(from Gando south)

CROP/INTERCROP	SERFACE AREA (hectares)
1. Yams with minor cassava component and a cowpea intercrop	0.5
2. Bulrush millet with a cowpea intercrop	0.4
3. Sorghum in a mixed maturity stand	1.4
4. Maize	0.2
5. Peanuts	0.3
6. Cotton	0.2
7. Rice (?)	
TOTAL	3.0*

NOTES:

*The three hectare base is a rough average estimated by the project design team which incorporates the effect of larger individual holdings in Bassar, Bafilo and Gando areas on the average farm size across the zone.

1. Except for small areas at the extreme south and north of the root crop zone, yams dominate the root crop component of farms. In dryland areas, cowpeas, peanuts, and/or sorghum are intercropped on and among yam mounds. To simplify calculations, cowpeas were chosen to model the intercrop. In bottomland areas, rice will often appear as an intercrop with yams. Given the lack of even a rough estimate of bottomland availability, it was not possible to assign rice as an intercrop to the model.
2. Bulrush millet is a 60-75 day crop cultivar often intercropped with cowpeas. Some areas also intercrop with 4-6 month millet and relay crop with mixed maturity sorghum. The latter combinations were excluded from the calculations for ease in numerical manipulations.
3. The sorghum mixed maturity stands 4-6 months may also be partially intercropped in some areas with millet, cowpeas, or peanuts.
4. For most of the root crop zone, maize is used as an early roasting food and does not cover large surface areas. The Bassar prefecture is an exception to this statement, but it does not substantially raise the model parcel size for maize encountered throughout the zone.
5. The inclusion of cotton in the model reflects the intensive efforts of SOTOCO in Bassar, Kante, Broukou, and Gando areas of the root crop zone.
6. Rice cultivation will replace some sorghum or maize area where bottomland is plentiful, e.g., Tamberma land.

Table 9 : REPRESENTATIVE BUDGET FOR CEREALS ZONE
(Approximately from Gando North)

	INITIAL AREA	INITIAL YIELDS	INITIAL PRICES	INITIAL GROSS VALUES	
GROSS PRODUCTION					
Millet/	0,70 ha	470 kg	60 CFA	19.740 CFA	
Cowpeas	-	300	130	27.300	
Sorghum/	2,00	680	60	81.600	
Millet	-	470	60	56.400	
Maize	0,30	825	60	14.850	
Groundnuts	0,40	570	70	15.960	
Cotton	0,30	635	65	13.383	
Rice	0,30	775	70	16.275	245.508 CFA
ON-FARM CONSUMPTION					
Cereals for 9 people 9 x 200 kg = 1800 kg x 60)					108.000
SEED REQUIREMENTS					
Cereals	125 kg		7.500		
Cowpeas	21		2.730		
Groundnuts	48		3.360		
Rice	30		2.100		15.690
SUB - TOTAL					121.818
MISC. FARM INPUTS (20%)					24.364
GROSS FARM REVENUES PER YEAR					97.454

Table 10 : REPRESENTATIVE FARM BUDGET FOR ROOT CROPS ZONE

(Approximately from Gando south)

	INITIAL AREA	INITIAL YIELDS	INITIAL PRICES	INITIAL GROSS VALUES	
GROSS PRODUCTION					
Yams /	0,50 ha	10.000 kg	30 CFA	150.000 CFA	
Cowpeas	-	300	130	19.500	
Millet/	0,40	470	60	11.280	
Cowpeas	-	300	130	15.600	
Sorghum	1,40	680	60	57.120	
Maize	0,20	825	60	9.900	
Groundnuts	0,30	570	70	11.970	
Cotton	0,20	635	65	8.255	+ 283.625
ON-FARM CONSUMPTION					
7 people x 200 kg = 1,400 kg Cereals 960 x 60 Tubes 500 x 30					- 69.000
SEED REQUIREMENTS					
Yams	500 kg			15.000	
Cereals	50			3.000	
Groundnuts	36			2.520	- 20.520
SUB-TOTAL					194.105
MISC. FARM INPUTS (20%)					- 38.821
GROSS FARM REVENUE PER YEAR					155.284

TABLE 11: FINANCIAL FARM BUDGET FOR CEREAL CROP ZONE
WITH INTRODUCTION OF ANIMAL TRACTION

CFA

CROPPING PACKAGE FOR CEREALS ZONE	YR 1	YR 2	YR 3	YR 4	YR 5
ASSUMPTION A :					
INCOMES					
GROSS CROP VALUE	245.508	295.155	346.166	395.268	451.753
COSTS					
CONSUMPTION	108.000	111.240	115.560	120.960	127.440
SEED STOCKS	15.690	16.439	16.788	17.573	18,514
MISC. FARM INPUTS	24.364	25.095	26.070	27.288	28.750
GROSS FARM REVENUES	97.454	139.381	187.748	229.447	277.031
ANTRAC PACKAGE A :					
DOWN PAYMENT	18.600				
ANNUITY	48.920	48.920	48.920	48.920	48.920
BENEFICE FLOWS	29.934	90.461	138.828	180.527	288.110
ANIMAL APPRECIATION					100,000
	- 67.520	9.617	+ 34.552	+ 71.379	213.114

TABLE 12 : FINANCIAL FARM BUDGET FOR ROOT CROP ZONE
WITH INTRODUCTION OF ANIMAL TRACTION

CFA

CROPPING PACKAGE FOR ROOT CROP ZONE	YR 1	YR 2	YR 3	YR 4	YR 5
ASSUMPTION A:					
INCOMES					
GROSS CROP VALUE	283.625	337.514	399.911	456.636	521.870
COSTS					
CONSUMPTION	69.000	71.070	73.830	77.280	81.420
SEED STOCKS	20.520	21.136	21.956	22.982	24.212
MISC. FARM INPUTS	38.821	39.986	41.538	43.480	45.809
GROSS FARM REVENUES	155.284	204.322	262.587	312,894	370.429
ANTRAC PACKAGE A:					
DOWN PAYMENT	18.600				
Annuity	48.920	48.920	48.920	48.920	48.920
BENEFIT FLOW	87.764	156.402	213.667	263.974	321.509
ANIMAL APPRECIATION					100.000
NET ANNUAL GAIN / LOSS	- 67.520	- 3.541	47.513	90.056	238.274

ANNEX TWO

ECONOMIC ANALYSIS

Appendix 3: PROJECT LEVEL ECONOMIC ANALYSIS

Table 13 : Estimates of Farm-level Economic Benefits in Cereal Crop Zone

Table 14 : Estimates of Farm-level Economic Benefits in Root Crop Zone

Table 15 : Allocation of AID Expenditures by Year and by Destination

Tables 15 A, B, C: Details of Table 15

Table 16 : Allocation of GOT Expenditures by Year and by Destination

Table 17 : ANTRAC Extension Activity; Gross Costs

Table 18 : ANTRAC Extension Activity; Gross Benefits (YR 1 - YR 10)

Table 19 : ANTRAC Extension Activity; Gross Benefits (YR 11 - YR 15)

Table 20 : Discounted Measures of Project Worth

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Table 13: Estimates of Farm-level Economic Benefits in Cereal Crop Zone

	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 7	YR 8	YR 9	YR 10
ASSUMPTION A:										
INCOMES										
GROSS CROP VALUE	245.508	292.155	346.166	395.268	451.268	451.735	451,735	451.735	451.735	451.735
COSTS										
CONSUMPTION	108.000	111.240	115.560	120.960	127.440					
SEED STOCKS	15.690	16.439	16.788	17.573	18.514					
MISC. FARM INPUTS [1]	24.364	24.364	24.364	24.364	24.364					
GROSS FARM CASH INCOME	97.454	140.112	189.454	232.371	280.950	280.950	280.950	280.950	280.950	280.950
AVERAGE ANTRAC PACKAGE J										
DOWN PAYMENT [2]	24.000									
ANNUITY	61.000	61.000	61.000	61.000	61.000					
INS/HEALTH/MISC. [3]						25.000	25.000	25.000	25.000	25.000
NET FARM CASH FLOW	12.454	79.112	128.454	171.371	219.950	255.950	255.950	255.950	255.950	255.950
NET OF BASE BASE YEAR W/O ANTRAC	- 85.000	-21.266	24.178	62.222	104.954	140.956	140.954	140.954	140.954	140.954
ANIMAL APPRECIATION	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000
PROJECT BENEFIT STREAM PER CEREAL FARMER	- 65.000	- 1.266	44.178	82.222	124.954	160.954	160.954	160.954	160.954	160.954

[1] Relative to farm output prices, farm input prices will not change.

[2] Normally, the down payment would be paid out of earnings from the previous year's harvest.

[3] Miscellaneous expenses refer to maintenance costs on equipment after purchase loan has been repaid.

Table 14: Estimates of Farm-level Economic Benefits in Root Crop Zone

	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 7	YR 8	YR 9	YR 10
ASSUMPTION A										
INCOMES										
GROSS CROP VALUE	283.625	337.514	399.911	456.636	521.870	521.870	521.870	521.870	521.870	521.870
COSTS										
CONSUMPTION	60.000	71.070	73.830	77.280	81.420					
SEED STOCKS	20.520	21.136	21.956	22.982	24.212					
MISC.FARM INPUTS	38.821	38.821	38.821	38.821	38.821					
GROSS FARM CASH INCOME	155.284	206.487	265.304	317.553	377.417	377.417	377.417	377.417	377.417	377.417
AVERAGE ANTRAC PACKAGE J										
DOWN PAYMENT	24.000									
ANNUITY	61.000	61.000	61.000	61.000	61.000					
INS/HEALTH/MISC.						25.000	25.000	25.000	25.000	25.000
NET FARM CASH FLOW	70.284	145.487	204.304	256.553	316.417	352.417	352.417	352.417	352.417	352.417
NET OF BASE YEAR W/O ANTRAC	- 85.000	- 14.456	38.150	82.635	133.182	169.182	169.182	169.182	169.182	169.182
ANIMAL APPRECIATION	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000
PROJECT BENEFIT STREAM PER TUBER FARMER	- 65.000	6.544	58.150	102.635	153.182	199.182	199.182	199.182	199.182	199.182

Table 15: Allocation of AID Expenditures by Year and by Destination

	PROPTA						DRDR					
	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6
PROJECT COSTS												
Technical Assistance	43,990	329,452	344,702	200,824	211,274	84,487	43,990	215,468	227,718	104,636	113,686	45,493
Commodity Procurement	78,318	51,250	59,280	7,500			99,692	13,750	88,155	2,500		
Construction	63,900						348,650					
Revolving Funds	71,500						303,500	300,000				
Operating Costs	36,656	18,880	18,880	18,880	18,880	9,440	64,334	43,420	43,420	43,420	43,420	21,710
SUB-TOTAL	294,364	399,582	422,862	227,204	230,154	93,927	860,166	472,638	359,293	150,556	157,106	67,203
Contingencies (10%)	29,436	39,958	42,286	22,720	23,015	9,393	86,017	47,264	35,929	15,056	15,741	6,720
Inflation (12%)	-	52,745	118,334	101,201	145,197	78,765	-	62,388	100,544	67,061	99,104	56,355
TOTAL PROJECT COSTS	323,800	492,285	583,482	351,125	398,366	112,085	946,183	582,290	435,766	232,673	271,931	130,270

As only one aspect of TAT can be considered to to have direct impact on farm production, AID and GOT contributions have been broken out to attribute only those expenditures which directly influence production to the benefit-cost analysis. In the presentations of the detailed figures for both AID and GOT contributions, the parenthesis for each line item reflects the percentage distribution between PROPTA and the two DRDRs (PROPTA/DRDR).

Table 15 A

	PROPTA						DRDR					
	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6
TECHNICAL ASSISTANCE												
Interim Coordinator (50/50)	43,990						43,990					
Project Coordinator (60/40)		77,988	77,988	77,988	77,988	38,994		51,992	51,992	51,992	51,992	25,996
Agricultural Economist (70/30)		90,986	90,986	90,988	90,986	45,493		38,994	38,994	38,994	38,994	19,497
Livestock Specialist (70/30)		90,986	90,986					38,994	38,994			
Agronomist (40/60)		51,992	51,992					77,988	77,988			
Short Term												
Livestock (70/30)				11,550	11,550					4,950	4,950	
Agronomist (70/30)				11,550	11,550					4,950	4,950	
Training/Data (70/30)		17,500	8,750	8,750				7,500	3,750	3,750		
Evaluations												
Mid-Term (60/40)			19,800						13,200			
Final (60/40)					13,200						8,800	
Secr./Transl. (60/40)			4,200		6,00				2,800		4,000	
Sub-Total	43,990	329,452	344,702	200,824	211,274	84,487	43,990	215,468	227,718	104,636	113,686	45,943

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Table 15 B

	PROPTA						DRDR					
	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6
COMMODITY PROCUREMENT												
Vehicles - Cars	17,000		17,000				22,500		22,500			
- 2 Wheels							23,000		23,000			
- Spares	4,250		4,250				12,125		12,125			
Animal/Farm Equipment	22,500	10,000					2,500					
Veterinary Equipment	4,000						6,000		7,000			
Training Equipment (75/25)		18,750	11,250	7,500				6,250	3,750	2,500		
Survey Equipment (75/25)		22,500	15,000					7,500	5,000			
Office Equipment (50/50)	30,568		11,780				30,567		11,780			
Sub-Total	78,318	51,250	59,280	7,500			99,692	13,750	88,155	2,500		
CONSTRUCTION												
Lama Kara								91,250				
Agbassa								7,400				
Tentiegou	63,900											
CAT's								180,000				
Wells								70,000				
Sub-Total	63,900							348,650				

Table 15 C

	PROPTA						DRDR					
	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6
REVOLVING FUNDS												
Animals	50,000						175,000	75,000				
Equipment							25,000	125,000				
Veterinary	21,500						3,500					
Sub-Total	71,500						303,500	200,000				
OPERATING COSTS												
Vehicles - Cars(50/50)	2,850	5,700	5,700	5,700	5,700	2,850	2,850	5,700	5,700	5,700	5,700	2,850
- 2 Wheels (0/100)							5,550	11,100	11,100	11,100	11,100	5,550
Incentives(0/100)							4,000	4,000	4,000	4,000	4,000	2,000
GOT per diem (50/50)	2,000	2,000	2,000	2,000	2,000	1,000	2,000	2,000	2,000	2,000	2,000	1,000
Office Utilities (0/100)							600	1,200	1,200	1,200	1,200	600
Kerosene (0/100)							600	600	600	600	600	300
Paper + Office Misc. (20/80)	1,220	2,440	2,440	2,440	2,440	1,220	4,880	9.760	9.760	9.760	9.760	4,880
Job Printing (80/20)	3,120	6,240	6,240	6,240	6,240	3,120	780	1,560	1,560	1,560	1,560	780
Training Operations (25/75)	1,250	2,500	2,500	2,500	2,500	1,250	3,750	7,500	7,500	7,500	7,500	3,750
Transport USA-Togo (40/60)	26,216						39,324					
Sub-Total	36,656	18,880	18,880	18,880	18,880	9,440	64,334	43,420	43,420	43,420	43,420	21,710

Table 16: ALLOCATION OF GOT EXPENDITURES BY YEAR AND BY DESTINATIONS

(U.S.$)

GOT PROJECT COSTS (PROPTA/DRDR)	PROPTA YR 1	PROPTA YR 2	PROPTA YR. 3	PROPTA YR 4	PROPTA YR 5	PROPTA YR 6	DRDR YR 1	DRDR YR 2	DRDR YR 3	DRDR YR 4	DRDR YR 5	DRDR YR 6
PERSONNEL												
Kara/Agbassa (50/50)	22,026	22,026	22,026	22,026	22,026	11,013	22,026	22,026	22,026	22,026	22,026	11,013
Tantiegou (100/0)	9,054	9,054	9,054	9,054	9,054	4,527	-	-	-	-	-	-
Atakpame (100/0)	18,798	18,798	18,798	18,798	18,798	9,399	-	-	-	-	-	-
C.A.T.s (0/100)	-	-	-	-	-	-	23,760	23,760	23,760	23,760	23,760	11,880
Sub-Total	49,878	49,878	49,878	49,878	49,878	24,939	45,756	45,756	45,756	45,756	45,756	22,893
VEHICLES												
PROPTA-North												
8-Ton Trucks	15,000		30,000									
3-Ton Trucks	10,001		10,001						10,001			
Pick-ups	18,752		18,752									
Station wagons	-		10,001									
Atakpame												
8-Ton Trucks	-		30,000									
3-Ton Trucks	6,667		6,667									
Pick-ups	12,501		20,835									
Station wagons	-		6,667									
Sub-Total	62,921		112,923						10,001			
CONSTRUCTION												
Materiel	50,000	30,000	20,000									
OTHER EXPENSES												
Vehicle Reparations and Spares	20,974	20,974	39,795	37,641	37,641	18,821	-	-	1,667	3,334	3,334	1,667
Utility Installations (50/50)	500	-	-	-	-	-	500	-	-	-	-	-
Office Supplies (75/25)	750	1,500	1,500	1,500	1,500	750	250	500	500	500	500	250
Training	-	3.750	7,500	7,500	7,500	3.750	-	4,688	9,375	9,375	9,375	9,375
Director's Furniture	2,500	-	-	-	-	-	2,500	-	-	-	-	-
Sub-Total	24,724	26,224	48,795	46,641	46,641	23,321	3,250	5,188	11,542	13,209	13,209	6,605
TOTAL	187,523	106,102	231,596	96,519	96,519	48,260	49,036	50,974	67,329	58,995	58,995	29,498
Contingency 10%	18,752	10,610	23,160	9,652	9,652	4,826	4,904	5,097	6,733	5,900	5,900	2,950
Inflation 12%	-	14,005	64,810	42,992	60,891	40,470	-	6,729	18,841	26,278	37,219	18,610
GRAND TOTAL - GOT COSTS	206,275	130,717	319,566	149,163	167,062	93,556	53,940	62,800	92,903	91,173	102,114	51,058

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Table 17 : ANTRAC EXTENSION ACTIVITY: GROSS COSTS
(U.S.$)

COST STREAM	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 7	YR 8	YR 9	YR 10
USAID[1]										
Commodities[2]	34,016	34,016	34,016	34,016	34,016	34,016				
Construction[3]	17,433	17,433	17,433	17,433	17,433	17,433	17,433	17,433	17,433	17,433
Revolving Funds[4]	25,175	25,175	25,175	25,175	25,175	25,175	25,175	25,175	25,175	25,175
Operational Costs	64,334	43,420	43,420	43,420	43,420	21,710				
Sub-Total	140,958	120,044	120,044	120,044	120,044	98,334	42,608	42,608	42,608	42,608
GOT										
Personnel	45,786	45,786	45,786	45,786	45,786	45,786	45,786	45,786	45,786	45,786
Vehicles[5]			3,333	3,333	3,333	20,000	20,000	20,000	20,000	20,000
Construction[6]	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Operating Costs[7]	10,000	10,000	10,000	10,000	10,000	25,000	50,000	50,000	50,000	50,000
Sub-Total	60,786	60,786	64,119	64,119	64,119	95,786	120,786	120,786	120,786	120,786
GRAND TOTAL	201,744	180,830	184,163	184,163	184,163	194,120	163,394	163,394	163,394	163,394

1 The cost of Technical Assistance has been dropped from the economic analysis as a sunk development cost and not appropriate to the analysis.

2 AID purchased commodities are depreciated at a flat rate over 5 years.

3 Investments in construction are depreciated at a flat rate over 20 years.

4 The revolving funds are given a life expectancy of 20 years as a mechanism to attribute an annual cost. As currently organized, they should be theoretically self-perpetuating.

5 During project life, vehicle is depreciated over 3 years. After year-6, GOT will be spending $20,000/year to maintain fleet.

6 Construction is depreciated over 20 years. 7 Operating costs for the GOT begin to increase in year-6 as AID pulls out.

Table 18: ANTRAC EXTENSION ACTIVITY: GROSS BENEFITS (YR 1 - YR 10)[1]
(U.S. $)

BENEFIT STREAM	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 7	YR 8	YR 9	YR 10
TUBER ZONE (40/Year)										
YR 1	- 8,667	873	7,753	13,685	20,424	26,558	26,558	26,558	26,558	26,558
YR 2		- 8,667	873	7,753	13,685	20,424	26,558	26,558	26,558	26,558
YR 3			- 8,667	873	7,753	13,685	20.424	26.558	26,558	26,558
YR 4				- 8,667	873	7,753	13,685	20,424	26,558	26,558
YR 5					- 8,667	873	7,753	13,685	20,424	26,558
YR 6						- 8,667	873	7,753	13,685	20,424
YR 7							- 8,667	873	7,753	13,685
YR 8								- 8,667	873	7,753
YR 9									- 8,667	873
YR 10										- 8,667
Sub-Total	- 8,667	- 7,794	- 51	13,634	34,058	60,626	87,184	113,742	140,300	166,856
CEREAL ZONE (60/Year)										
YR 1	- 13,000	- 253	8,836	16,444	24,991	32,191	32,191	32,191	32,191	32,191
YR 2		- 13,000	- 253	8,836	16,444	24,991	32,191	32,191	32,191	32,191
YR 3			- 13,000	253	8,836	16,444	24,991	32,191	32,191	32,191
YR 4				- 13,000	- 253	8,836	16,444	24,991	32,191	32,191
YR 5					- 13,000	- 253	8,836	16,444	24,991	32,191
YR 6						- 13,000	- 253	8,836	16,444	24,991
YR 7							- 13,000	- 253	8,836	16,444
YR 8								- 13,000	- 253	8,836
YR 9									- 13,000	- 253
YR 10										- 13,000
Sub-Total	- 13,000	- 13,253	- 4,417	12,027	37,018	69,209	101,400	133,591	165,782	197,973
GRAND TOTAL	- 21,667	- 21,047	- 4,468	25,661	71,076	129,835	188,584	247,333	306,082	364,831

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Footnotes to Table 18

[1] This table calculates the gross benefits due to project interventions over 10 years. Basic to these calculations are 4 assump ions:

1. The equipment package has a life expectancy of 10 years.

2. Animals appreciate in value by 100.000 CFA/pair in their expected work life (5 years) and are hence essentially self-financing.

3. 100 farms will adopt ANTRAC each year.

4. All calculations are based on Assumption A, ANTRAC package A.

Table 19: ANTRAC EXTENSION ACTIVITY ; GROSS BENEFITS (YR 11 - YR 15)[1]
(U.S.$)

BENEFIT STREAM	YR 11	YR 12	YR 13	YR 14	YR 15
TUBER ZONE (40/Year)					
YR 1	22,638	24,305	24,305	24,305	24,305
YR 2	26,558	22,638	24,305	24,305	24,305
YR 3	26,558	26,558	22,638	24,305	24,305
YR 4	26,558	26,558	26,558	22,638	24,305
YR 5	26,558	26.558	26,558	26,558	22,638
YR 6	26,558	26,558	26,558	26,558	26,558
YR 7	20,424	26,558	26,558	26,558	26,558
YR 8	13,685	20,424	26,558	26,558	26,558
YR 9	7,753	13,685	20,424	26,558	26,558
YR 10	873	7,753	13,685	20,424	26,558
YR 11	- 8,667	873	7,753	13,685	20,424
YR 12		- 8,667	873	7,753	13,685
YR 13			- 8,667	873	7,753
YR 14				- 8,667	873
YR 15					- 8,667
Sub-Total	189,496	213,801	238,106	262,411	286,716
CEREAL ZONE (60/Year)					
YR 1	28,271	29,938	29,938	29,938	29,938
YR 2	32,191	28,271	29,938	29,938	29,938
YR 3	32,191	32,191	28,271	29,938	29,938
YR 4	32,191	32,191	32,191	28,271	29,938
YR 5	32,191	32,191	32,191	32,191	28,271
YR 6	32,191	32,191	32,191	32,191	32,191
YR 7	24,991	32,191	32,191	32,191	32,191
YR 8	16,444	24,991	32,191	32,191	32,191
YR 9	8,636	16,444	24,991	32,191	32,191
YR 10	- 253	8,836	16,444	24,991	32,191
YR 11	- 13,000	- 253	8,836	16,44	24,991
YR 12		- 13,000	- 253	8,836	16,444
YR 13			- 13,000	- 253	8,836
YR 14				- 13,000	- 253
YR 15					- 13,000
Sub-Total	226,244	256,182	286,120	316,058	345,996
GRAND TOTAL BENEFIT STREAM	415,740	469,983	524,226	578,469	632,712

Footnote to Table 19:

[1] Benefit calculations are continued through to year-15 in order that those farmers who adopt ANTRAC in project year-5 are followed through the life of their equipment. The earlier adopters are assumed to repurchase equipment and these costs are deducted from the benefit stream. The adoption rate of 100/year is assumed to continue through year-15.

Table 20: DISCOUNTED MEASURES OF PROJECT WORTH[1]
(U.S.$)

	GROSS BENEFITS	GROSS COSTS	CASH FLOW	PRESENT WORTH @ 12%	PRESENT WORTH @ 8%	BENEFITS DISCOUNTED @ 12%	COSTS DISCOUNTED @ 12%
YR 1	- 21,667	201,744	- 223,411	- 199,506	- 206,879	19,349	180,157
2	- 21,047	180,830	- 201,877	- 160,896	- 173,009	16,774	144,122
3	- 4,468	184,163	- 188,631	- 134,305	- 149,773	3,181	131,124
4	25,661	184,163	- 158,502	- 100,807	- 116,499	16,320	117,128
5	71,076	184,163	- 113,087	- 64,120	- 77,012	40,300	104,420
	49,555	935,063					
6	129,835	194,120	- 64,285	- 32,593	- 40,500	65,826	98,419
7	188,584	163,394	+ 25,220	+ 11,399	+ 14,703	85,240	73,854
8	247,333	163,394	+ 83,939	+ 33,911	+ 45,327	99,923	66,011
9	306,082	163,394	+ 142,688	+ 51,510	+ 71,344	110,496	58,985
10	364,831	163,394	+ 201,437	+ 64,863	+ 93,265	117,476	52,613
	1,286,220	1,782,759					
11	415,740	163,394	+ 252,346	+ 78,423	+ 108,256	119,317	46,894
12	469,983	163,394	+ 306,590	+ 78,793	+ 121,716	120,786	31,042
13	524,826	163,394	+ 360,832	+ 82,631	+ 132,786	120,048	37,417
14	578,469	163,394	+ 415,075	+ 85,090	+ 141,126	118,586	33,496
15	632,712	163,394	+ 469,318	+ 85,885	+ 147,835	115,786	29,901
IRR = 10%[2]	3,907,350	2,599,729		- 125,722	+ 112,686		
BC - .97 @ 12%						1,169,408	1,205,583
16 BC = 1.04 @ 12%	691,461	163,394				112,708	26,633
17	750,210	163,394				109,531	23,856
18 BC = 1.17 @ 12%	808,959	163,394				105,165	21,241

Footnotes to Table 20

1 Both Internal Economic Rates of Return and Benefits Cost Ratios have been calculated. The implications of these project worth calculations are discussed in the text.

2 Methodology for estimating IRR taken from J.P.Gittinger, Economic Analysis of Agricultural Projects, 1972, pp.76-80.

A: $\frac{\text{Average Annual Benefits}}{\text{Total Initial Costs}} = \frac{249,716}{949,793} = .26$

B: $.26 - .05 = .21$

C: $2(.21)^2 = .09$

$.21 - .09 = .12$

D: Not applicable

E: Decrease by .02 to .10

F: PW at 12% = -125,722 PW at 8% = +112,686

G: $8 + 4\left(\frac{112,686}{738,408}\right) = 8 + 4\ (.47) = 8 + 1.89 = 10\%$

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ANNEX THREE

TECHNICAL ANALYSIS

LAND ISSUES

Land Availability

Table 1 gives population densities on a prefecture basis for Kara and Savanes regions in 1981. The figures cannot be taken as definitive because they do not incorporate allowances for recent expansion of game reserves nor separate rural from town populations. Still they elicit the question of whether there is land available for the expansion in cultivated surface area often expected from the introduction of animal traction. The question is fundamental to determination of project viability. To answer it, the following analysis examines first, the potential and expected impact of the adoption of animal traction on surface area cultivated at the farm level and, second, the availability, capability and use of the land resource base at the regional level.

The Potential Impact of Animal Traction on Expansion of Cultivated Area

In a recent review of West African animal traction projects, it was noted that a range of 4-55% increase in cultivated surface area may be expected in the medium-term following the introduction of draft equipment. (Sargent et al, 1981) However, simple application of these average impacts to the Togo Animal Traction Development Project (TAT) would be unwise because of the complexity of the interaction between the introduced animals and equipment with farm operations. The discussion which follows, outlines some of the interactions which have led the PP team to the conclusion that expansion in cultivated surface area will be modest, probably under 30% over the five and one-half years of the TAT project.

There have been several studies which indicate that larger land holders are more likely to be early adopters (Barrett et al., 1981; Delgado and McIntire, 1981; Sargent et al, 1981). The reasons for this are known and relate generally to the ability of bigger farmers to undertake greater initial risks and financial debt burdens than smallholders can. The principal effects of draft equipment use by this stratum of farmers may often be increased labor productivity. The time required for a given operation may be reduced and its timeliness improved. There may therefore be little incentive to expand surface area, particularly if off-farm enterprises offer greater returns. Increased capital productivity (better seedbed preparations, improved fertilizer incorporation) may also permit intensification rather than extensification of production.

Another complicating factor at all farm sizes is that the equipment used may not be reducing the key labor bottlenecks which limit expansion. It may be that no equipment is available which can be employed for a particular operation. An important example for the Kara region is the digging

of yam mounds. While many workers have tried to develop mounding equipment, no design has passed field tests.

Available equipment may also not be adapted to local cultural practices. The ridger now being extended in Togo cannot be used to weed the slopes of the ridges formed. Consequently, hand labor must be used. Provisions of a modified set of ridger wings with attached scrapers would reduce labor requirements.

Even when equipment is available and adapted, it may not be used for a variety of reasons. Often extension agents and animal trainers receive training only on the plow, ridger, harrow and cart. The weeding implements, despite the weeding labor constraint which often dominates hand hoe agriculture, receives little attention in training and, consequently, little stress is laid upon them in extension programs. Nearly all extension personnel encountered during the Project Paper design had received no practical instruction in the use of the available weeding equipment. Few had even been exposed to the construction of the long yokes, alternative weeding tools ("Canadien" shovel and chisel points), or the use of single animals for cultivation.

Besides these phenomena, there may be no economic incentive for a head of household to mechanize weeding operations which restrict the surface area capable of being cropped. A male head of household may see zero opportunity cost to the use of women and children to weed, or may perceive an increased social opportunity cost if he abandons group weeding parties and has to spend more of his own time in the fields.

Another reason to believe that the introduction of animal traction will not result in rapid land expansion is that the technology involves readjustment of many elements of current farming practice. There is a learning curve for acquisition of skills in handling and caring for draft stock, using, adjusting, and maintaining equipment, and modifying crop programming and cultural practices to take better advantage of available draft power and equipment. It cannot, and should not, be expected that a farm family will transform itself into expert animal traction farmers in one, two, or three growing seasons. A reasonable progression might be use of the plow and ridger for two crop years before mechanical weeding is attempted. This may be followed by two years of testing of equipment, animal and crop combinations before the farmer is capable of expanding crop area. Even this fairly optimistic progression would mean only that expansion <u>could</u> start by the fifth growing season.

Should all of the farm-level constraints to surface area expansion be removed, there still may be no economic incentive to do so. Access to markets may be restricted or producer prices may be too low. The Economic Analysis in Annex Two discusses these potentially restraining factors.

Individual access to land can also play a role in curbing expansion. However, as discussed in the Social Soundness Analysis in Annex Four, traditional land tenure systems in northern Togo are not normally restrictive in this sense.

Monitoring the Actual Impact of Animal Traction on Farm Size

While the design team's best guess is that farm expansion due to animal traction technology will be on a modest scale, it would be irresponsible to claim that the available information decisively supports the forecasted impact. Therefore, the project will track farm size status over time using data collected by the Agricultural Statistics Service and the extension agents who work from the CATs. This information, combined with other farm level data, will be analyzed by the Monitoring and Evaluation unit of PROPTA (see Annex Twelve) to determine whether, and at what rate, the use of animal traction leads to crop land expansion.

Also, given the overall thrust of the project to develop viable national policies for animal traction, the Monitoring and Evaluation Unit will analyze past (1970-71) and current census (1981-82) and agricultural census (1982-83) data to determine:

- if the data permits interpretation of animal traction effects on cultivated surface area;
- if so, what are trends in expansion and rates of expansion attributable to draft power; and,
- if not, how to modify the ten-year agricultural census and annual agricultural sample survey questionnaires, sampling procedure, and/or execution of field work to permit analysis and interpretation of the impact questions.

Regional Land Availability, Land Use, and Capability Issues

The preceding sections indicated that the AID-funded TAT project will most probably not have a major impact on expansion of crop area. However, other agricultural and rural development projects are likely to have a much quicker and widespread effect on land occupation, as they have the explicit objectives to clear land for resettlement or production and to increase access to land.

In addition, there are changes in land use in northern Togo which affect the future potential for agricultural expansion. One is the rapid expansion of wildlife reserves along the Keran and Oti rivers. While official figures on the amounts of land included were not obtained, it is clear from the new boundaries of the reserves that dislocation of some farming population has already occurred. While the net impact on present and future agricultural production cannot be estimated without more detailed study of the land capability and population pressure on areas outside the reserves, it is clear that a significant portion of higher productivity alluvial soils has been removed from the agricultural sector in eastern and southern Savanes region. However, it is beyond the scope of the design team to speculate on the relative tradeoffs between game reserves which protect wildlife and add tourist value, and use of the land for agricultural production.

There are at least three major project-level phenomena which do or will have important land use implications. First, agricultural development projects in northern Togo may over-intensify land use or excessively modify drainage patterns in individual watersheds, increasing run-off and erosion and, potentially, environmental degradation. There have already been some unofficial reports that road and land clearing activities in parts of the Kara region have resulted in higher peak run-off rates. Some remedial actions (planting of tree bands) have begun in some areas. Second, current draft equipment packages almost invariably include carts. Besides questions of cart design and cost, which as the economic analysis in Annex Two explains may push a farmer's debt burden beyond feasible levels, carts may increase the distance and intensity at which firewood is collected. While there are no quantitative studies which examine such changes in firewood collection behavior, informal reports from neighboring West African countries indicate that when a cart is used to haul wood, tree stand utilization increases skill socio-economic advantages to cart use may outweigh environmental disadvantages in many of northern Togo's environments, over the near and medium-term. Third, over a 15 to 20-year period, acceptance and the economic use of animal traction equipment could lead to significant land expansion.

Therefore, the need remains to ask questions about land use in the Kara and the Savanes regions, and, optimally to promote the investigation of similar questions at the country-level through PROPTA, the umbrella project which will coordinate national animal traction efforts. On the other hand, the design team seriously questions how much effort reasonably can be expected from an implementation project such as TAT on analysis of large regional and national issues of basic natural resource utilization. While the TAT project will collect and analyze farm-level data on the impact of animal traction on local land use, its resources cannot be stretched to undertake region-wide soils, vegetation, and water resources inventory nor set up extensive ground survey sampling, aerial photography or other remote sensing monitoring procedures needed to support informed natural resource allocation policy decisions.

If AID, other donors and the GOT are serious about land issues, it is the position of the design team that they should vigorously support a single national resource inventory and monitoring system to serve as the basis for project design, as well as policy formulation, rather than ask individual projects to undertake under-funded and fragmentary analysis in which little real confidence can be placed. The environmental analysis in Annex Nine follows up on this point by suggesting a range of systems to monitor land use which are linked to the availability of extra-project funds (centrally-funded programs, REDSO/WA, etc.). In the absence of external funding the TAT project will be able to do little more than very rough extrapolation from farm-level data.

There are a number of reasons why the preceding discussion has been qualitative rather than quantitative. First and foremost, there is very little reliable data on any aspect of animal traction, a state which is commented upon at length in Annex 13 - Monitoring and Evaluation. Secondly, attempts to associate the general phenomenon of land expansion with the introduction of animal traction can be extremely misleading. In general, unless a significant portion of a region's populace adopts animal traction, it is almost certain that, over the medium-term, land occupation due to population growth will greatly overshadow that due to greater available power at the farm-level. Other phenomena that confound cause and effect analysis are: increases in land occupation due to declining soil fertility and shortened rotations (again a symptom of demographic pressure); movement onto shallower or more draughty soils which have an initial low productivity potential which in turn requires cultivation of larger expanses to achieve the same production as on more fertile sites; and, major donor efforts to open new territory to agricultural activity. Examples of the latter include integrated rural development projects such as FED-La Kara and the UNDP-FAO Project North-Togo which build access roads, supply water, clear land, and create the service infrastructure to support resettlement. Both projects were made possible, in whole or part, by a continuing effort by the WHO to control the Simulium fly vector for onchocerciasis in West African river valleys.

The PP team suspects, though it cannot conclusively demonstrate, that the introduction of animal traction technology has had little impact on expansion of the agriculturally occupied land area in northern Togo to date. Population growth is likely to remain the principal long-term cause. In the medium-term donor-assisted resettlement projects (FED-La Kara and the Oti Valley project) and production-oriented projects (UNDP-FAO's Project North-Togo, IBRD's SOTOCO II project) are likely to have a much greater effect on land occupation than draft animal technology. This is due to their direct effects in clearing areas for resettlement and production blocks and indirect effects through construction and rehabilitation of roads, water supplies, and markets.

In sum, the best current guess by the design team is that surface area expansion at the farm level will occur slowly. In part, site selection criteria were used to ensure this result. Most sites for extension centers (CATs - Centres d'Appui Technique) were chosen in areas where individual parcels were observed to be above 0.25 hectares, large enough to initiate animal traction use. Past experience also indicates it may take from three to five growing seasons before weeding implements are used. However, it must be noted here that the project will make concentrated effort beginning in year two (1983-84 growing season) to extend the use of weeding equipment. It is expected that a minimum of two seasons will be required for farmers to master and integrate the equipment with their crop programs. The extension effort, even if unusually successful, only provides the ability to reduce the weeding labor constraint. In practice other factors may inhibit an increase in farm size, e.g., crop prices, perceived risks or competing economic opportunities.

Project Site Selection

While essentially all project sites were proposed by regional authorities, final selection of work locations was guided by basic land availability criteria. Land criteria took into account the physical surface area available and land capability. For the former only rough qualitative estimates of occupation rates are available. While population density figures and maps are available, they are not corrected for town and urban populations nor forest and wildlife reserve areas. Also, little confidence can be placed in existing estimates of farm size, as is discussed in the Social Soundness Analysis in Annex Four. A recent AID-funded study of agricultural activity in northern Togo (Hermann, 1982) gives a very useful inventory of available maps, population density data, soils surveys, aerial photography, and Landstat coverage but could not stratify land occupation rates for different parts of the north, even in qualitative terms.

Faced with this situation, the team worked with available soils reconnaissance maps and site visits to make extremely rough determinations of land occupation by crops and livestock. Besides occupation, additional selection criteria used were: proximity to other donor-assisted projects (avoided), water availability, density of tree cover (higher density areas were avoided), road access, existing physical infrastructure, presence of government extension agents, and past and current history with animal traction.

Two of the final sites have less than optimal land availability. At Tantiegou, the site of the national buying center, there is a lack of free range. The available area consists of about 38 hectares of bottom land (bas-fond) next to an old BDPA irrigation project. Six, six-hectare pastures will be enclosed and improved under a rotational grazing system. Brewery wastes, cotton seed, other crop byproducts, and fodder will be used to support animals moving through the buying station for a two-week quarantine. While a larger area would be desirable, the design team believes that its proximity to major cattle suppliers and to CNCA Dapaon, which will eventually manage the cash transactions, outweighs the low land availability.

The second suboptimal site is Kante in the Kara region. This site is located at a Service d'Elevage corral and storehouse. Its use will be restricted to transhipment of animals and equipment for which its location near the intersection of north-south and east-west roads gives it a comparative location advantage. However, it is a last priority center, and will be dropped if a Peace Corps volunteer is not available to help staff it.

ANNEX THREE TECHNICAL ANALYSIS

LIVESTOCK

SUPPLY AND DEMAND

The initial livestock question in any animal traction project is whether there is a sufficient supply of suitable draft animals to meet projected demand. Table 1 gives the national herd figures for each region from 1970-75 and 1981. The largest concentration of cattle is in Savanes region followed by Centrale, Kara, Plateaux and Maritime regions. The most important cause of this distribution is reported to be the increase in incidence of tryponasomiasis from north to south. The gradient in disease is also reflected in the breed of animal raised. In the Savanes region the Zebu group of cattle (Bos indicus) are found with the dominant breeds of the Bos taurus or taurin species. In the north larger animals are found. Crosses with Zebu cattle are frequent in herds made up of Samba and Borgou breeds weighing up to 250 kg. Other breeds found more to the south include N'dama (up to 200 kg), Baoule (up to 180 kg), and the smaller Lagunaire and Nuturu breeds (around 110-120 kg).

Using the available data herd growth rates were calculated from 1970-75 period and extrapolated to 1981. The results of this calculation are found in the last line of Table 1. While substantial counting, migration and seasonal errors may be included in the figures, it appears that national herd growth may be slowing and relative national distribution may be shifting. Herds in the Kara and Centrale regions appear to have been in equilibrium state for some time. The Savanes herd may also be stabilizing. The Plateaux and Maritime herds, on the other hand, seem to have increased substantially since 1975. In-migration (especially from Ghana) may have played a significant role in herd growth in these two regions, but this cannot be confined without better information on herd composition.

Cattle density figures are given in Table 2. They show a north to south decrease in density of occupation. All regions except Savanes have experienced an increase in rates of land occupation by cattle during the 1979-1981 period.

Table 3 gives a comparaison of the only available independent estimate of the national cattle herd. It dates from the 1972-73, 73-74 agricultural census. Unfortunately, the sample drawn excluded herders without farms from the survey. As the census takers were aware, this would normally result in an underestimation of the animal population of the country. The comparison generally bears this out except for the Savanes region, where the census significantly overestimated cattle numbers compared with the count of the Animal Health Service.

TABLE 1

NATIONAL HERD SIZE

NUMBER OF HEAD OF CATTLE BY REGION (000's)

Year	Region Maritime	Plateaux	Centrale	Kara	Savanes	National Total
1970	11	28	52	31	72	194
1971	10	30	52	33	67	192
1972	11	31	50	32	74	198
1973	12	32	51	32	81	208
1974	11	33	50	31	81	206
1975	11	31	55	32	98	227
N/A						
1981	15	47	58	33	92	245
1981 Est.[1]	11	35	59	33	142	280

Sources: Adapted from Josserand, 1979, p.12, for years 1970-75.
Department of Animal Health 1981.

Notes : [1] Calculated from the 1970-75 data. Growth rates used: Maritime-0, Plateaux-0.0204, Centrale-0.0611, Kara-0.0064, Savanes-0.0617, National-0.0314 (Actual-0.0212).

TABLE 2

CATTLE DENSITY

BY REGION 1970, 1975, 1981

Region	Density (cattle/km2) 1970	1975	1981
Maritime	1.68	1.75	2.34
Plateaux	1.64	1.84	2.77
Centrale	2.55	2.70	2.83
Kara	7.11	7.30	7.56
Savanes	8.40	11.30	10.67
Togo	3.40	3.40	4.31

Sources: Josserand, 1979, p.19. 1981 figures calculated by the PP team from Animal Health Service data on regional population.

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TABLE 3

COMPARISON OF ANIMAL HEALTH
AND AGRICULTURAL SURVEY AND STATISTICS
SERVICE ESTIMATES OF
REGIONAL CATTLE POPULATIONS IN 1973[1] (000's)

Region	Animal Health Estimate	Agricultural Statistics Estimate
Maritime	12	N/A
Plateaux	32	17
Centrale	51	58
Kara	32	31
Savanes	81	93
Togo	208	199

Sources: Animal Health Service and Agricultural Statistics Service 1972-73 and 1973-74.

[1] The Agricultural Statistics Service gives no explicit data for its estimate obtained during the 1972-73 and 1973-74 agricultural census. The design team arbitrarily selected 1973 as the midpoint of the survey work.

The two other major points of difference are the figures for the Plateaux and Maritime regions. In the former, the census figure is about half the Animal Health Service's estimate, while in the latter, no data for cattle are given. A new agricultural census is underway (1982/83) which has corrected its sampling procedure to include herders in the census in all regions. Data from this work should be available in 1984.

Given general considerations for animal conformation and size needed for animal traction, a rough estimate of the total pool of draft cattle should probably include animals only from the Savanes, Kara,and Centrale regions. In 1981 this population was estimated to be 183,000 head, or 75% of the national herd. To determine the likelihood that this portion of the herd can supply draft animals, it is necessary to examine propable demand levels for draft power and competition for animals as a meat supply.

Table 4 gives a projected demand for draft animals based on rough estimates of requirements given for current animal traction projects. The jump from 500 to 1000 animals in 1983/84 is due to the team's evaluation of when the new generation of animal traction projects will begin to consolidate field activities (TAT, FED-V, and SOTOCO II). An annual growth rate of about 24% in reinvestment of new pairs is assumed over a ten-year period. An assumption is also made that without important increases of animal supply, expansion in animal traction will be restricted by the supply of replacement animals by about 1992.

It is necessary to refer to existing knowledge about herd strucure to explain why the assumption about supply saturation is made. Table 5 gives the national herd age structure as reported by Josserand (1979) for 1975. One of the findings of the report was that the relative offtake rate for male animals increased during most of the 1970-75 period, but was leveling off by 1975. For a tropical African herd the percent representation of males in the 1-2 and 3-5 year classes was very low in 1975. The leveling in male offtakes rates may have reflected a realization on the part of herders that they were reducing herd growth rates and the finished weight of animals going to market.

Assuming that offtake rates stabilized at 1975 levels during the following six years, the 1981 national herd structure would be represented by the calculations presented in Table 6. With no imports, a survival rate of .95, and recruitment of males only for animal traction, it seems clear that animals of appropriate size (age) are present in limited quantities in Togo. Purchase of about 2,000 head of 2 1/2 to 3 1/2 year old males will definitely increase competition on local cattle markets and prices will rise from their current 55,000 CFA per head.

However, analysis of the impact of animal traction on meat supply is not so straightforward. In early years meat is withdrawn from the market. Then, after five years of use a cohort of animals in the 220 kg range will be entering the marketplace as replacement cohort of 120 kg is purchased. Using a conversion factor of 50% for live weight to carcass weight shows that in 1982/83, while the total demand of 1,400 head removes 84 tons of meat from the market, the slaughter of 900 eight to ten year old animals would provide 99 tons of meat, an increment of 15 tons. In succeeding years a net increase in meat supply would occur until steady state conditions were achieved. Table 7 presents the evolution of the impact of male animal reinvestment for draft purposes on meat supply. Two years of steady state conditions would be required to wipe out the accumulated meat withdrawal of 375 metric tons accumulated over 15 years. The annualized average of 25 tons net meat withdrawal due to animal traction represents 0.8% of estimated national beef supply and .16% of national meat supply in 1981 terms. However, the 1977-82 programs withdrew about 2% of the beef supply and .9% of the national meat supply. This along with

increased demand from Nigeria for meat probably accounts for the jump in animal prices from 30,000 to 55,000 CFA over the same period.

TABLE 4

PROJECTED DEMAND FOR DRAFT ANIMALS

Year	New Animals	Replacement Animals[1,2]	Total Demand	Useful Herd Size[4]
1982/83	500	900	1,400	186,000
1983/84	1,000	900	1,900	187,000
1984/85	1,000	900	1,900	192,000
1985/86	1,000	900	1,900	195,000
1986/87	1,000	900	1,900	198,000
1987/88	1,500	1,400	2,900	210,000
1988/89	1,500	1,900	3,400	204,000
1989/90	1,500	1,900	3,400	208,00
1990/91	2,000	1,900	3,900	210,000
1991/92	- [3]	2,400	2,400	214,000

Notes: [1] Assumes replacement of animals after five years of use.

[2] Table starts with a base of about 4,500 animals distributes over the past five years. The 1982/83 through 1986/87 replacement figures are calculated on this base.

[3] Model assumes saturation at 15,000 animals or 7,750 pairs by 1990/91.

[4] Useful herd sizes refers to the herds from Savanes, Kara, and Centrale regions for which an intrinsic rate of natural increase of 0.0223 for Savanes, 0.0057 for Kara, and 0.0099 for Centrale is calculated from the 1970-1981 period.

TABLE 5

HERD AGE STRUCTURE 1975
(%)

Male	Age	Female
.6	7 - 10	1.4
.8	6 - 10	14.1
1.4	3 - 5	21.1
2.1	1 - 2	12.7
21.1	Calves	24.7

Source: Calculated from Josserand, 1979, p.19

TABLE 6

HERD AGE STRUCTURE 1981
(Estimated)

Male		Female
1,500	7 - 10	3,400
2,00	6 - 10	34,600
3,400	3 - 5	51,700
5,200	1 - 2	31,100
51,700	Calves	60,500

Total 245,100

Source: Calculated from animal health records and herd age structure recorded in Josserand, 1979, p.19

It should be noted that the above discussion is based on data which needs to be verified and modified using the results of the 1982/83 agricultural census now underway. However, if the data and assumptions are fairly accurate the analysis indicates that:

- the national herd growth rate slowed during the late 1970's;
- the trend developed during the early 1970's towards heavy offtake of young bullocks resulted in a herd structure in which males of sufficient age and weight for draft use are underrepresented;
- if these trends hold true for the regional herds (especially in the Savanes region) continuing upward pressure on bullock prices can be expected, unless cheaper animals are available in quantity from Ghana, Benin, and southern Upper Volta;
- as the size and lucrative nature of livestock markets in Nigeria and Ivory Coast make them increasingly competitive with the Togo market, it is clear that animal traction projects will need to adopt new strategies to ensure supply of appropriate reasonably priced draft animals over the next five years.

The largest untapped supply of draft power is the cow population. With proper nutrition cows can work up to about one month before calving. However, control of breeding and close nutritional supervision is required. Neither of these conditions is fulfilled at present nor likely to be met over the near-term until good dry season fielding practices are established at the farm level. The key to dry season feeding at the farm level practices will be a combination of fodder conservation and establishment of forage crops on fallow and/or relay cropped land. (See the section on forage crop establishment in this annex). Since such practices will take at least four or five years to extend at the farm-level, it would be 1987 before a strong emphasis on cows as draft animals could or should be made. In the short-run, the TAT project can only attempt, where possible, to reduce tillage intensity so that a single ox can be used, or that the same oxen can be used on more than one farm. The discussion in this annex of cropping practices and equipment packages discusses these options in more detail.

For the long-term, the TAT project will establish pilot herds at Tantiegou and Agbassa which will be managed with extension practices to see if national herd growth rates can be sustainably increased.

All of these problems require attention. It will be the livestock specialist's job to prioritize these efforts in consultation with GOT staff and expatriate technicians so that good use of project resources and time is made.

TABLE 7

IMPACT OF PROJECTED EVOLUTION
OF ANIMAL TRACTION ON MEAT SUPPLY

Year	Meat supplied by slaughtered animals[1] MT	Meat withdrawn by purchases[2] MT	Net change MT
1977-82	0	270	(270)
1982/83	99	84	15
1983/84	99	114	(15)
1984/85	99	114	(15)
1985/86	99	114	(15)
1986/87	99	114	(15)
1987/88	154	174	(20)
1988/89	209	204	5
1989/90	209	204	5
1990/91	209	234	(25)
1991/92	264	144	120
1992/93 Steady state[3]	341	186	155

Notes: [1] The quantity of meat supplied by replacement animals from Table 4 evaluated at 220 kgs/head x .50 carcass conversion ÷ 1000 kgs/MT = 0.11 mt/head.

[2] The quantity of meat withdrawn from the market for draft purposes, evaluated at 120 kgs/head x .50 carcass conversion ÷ 1000 kgs/MT = .06 MT/head

[3] Steady state assumes no expansion or loss in animal traction units and annual slaughter and replacement at 3,100 animals. (Refer to Table 4 for the data on animal numbers.)

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ANNEX THREE

LIVESTOCK

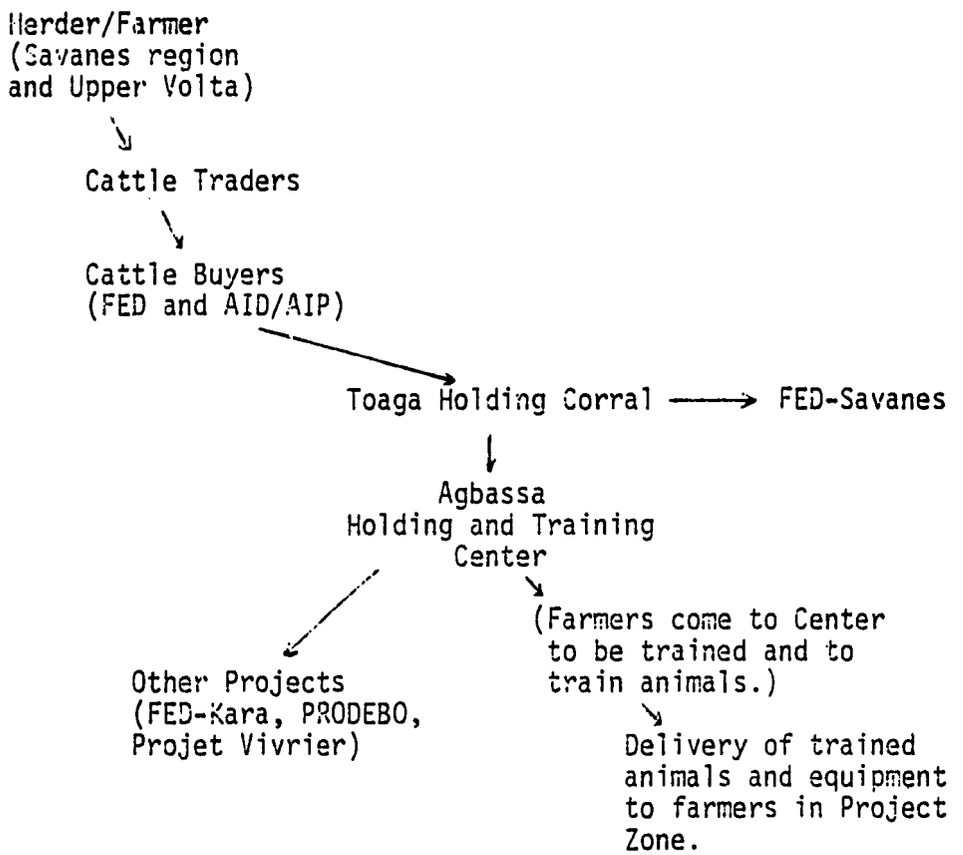
ANIMAL SUPPLY PROCEDURES

Many projects involved in animal traction in Togo carry out their own buying operations. The UNDP/FAO Project North-Togo buys many of its animals on contract from Upper Volta sources. SOTOCO buys animals in Guering Kouka (Kara region) and Benin. PRODEBO, which currently has responsibility for supply of draft animals to Centrale, Plateaux and Maritime region, buys animals in Centrale, Kara and Savanes and has explored contract purchases in Upper Volta. The FED La Kara, FED Savanes, and the AID-funded AIP in animal traction have joined forces to coordinate buying operations in the Dapaong (Savanes) area. A buying team composed of a FED Savanes livestock technician and a Peace Corps volunteer cattle buyer purchase stock throughout the year for shipment to FED and Projet Culture Attelee (AID) animal training and distribution centers. The AIP project in turn supplies the Kara region extension teams, the Entente Fund's Projet Vivrier (Atchangbade-Sirka) and several PVO projects. The intervention of the projects in cattle markets has led to inter-project competition. Besides the upward pressure on prices this has had, the duplication in project buying activities has undoubtedly added to the handling and distribution costs of animals. Consequently, one of the major driving forces behind the movement among donors and GOT to create a national animal traction organization has been to assure the needed supply of animals. It has been generally concluded that a unified buying and distribution system would be able to achieve this goal and benefit from certain economies of scale in operating and management costs. In order to explore these points further, the following sections describe current national buying organizations that can support animal traction extension efforts.

Current Procedures - FED and AID

As shown in Figure 1, herder and farmer suppliers of animals generally sell their stock to merchants, who have been involved mainly in meat marketing activities in the past. There are no formally organized cattle markets in the Savanes region. Buyers and sellers get together at mutually agreed upon places and times, although there are generally recognized areas for transactions. Currently, the FED and AID project buyers have established good relations with merchants which

Figure 1. CURRENT ANIMAL SUPPLY



has facilitated the delivery of stock to the Toaga holding corral. At purchase time, animals are eartagged and a cash payment made. When 20 to 40 animals have been accumulated for trans-shipment, the Animal Health Service sends a veterinary team to inspect and vaccinate the group. The animals are then carried by truck to the FED-Savanes project zone or the Agbassa center where they are held for observation, deticking, breaking and training. The current extension practice is to bring farmers to the centers where they learn to train animals that have already been broken. The trained pair of animals and an equipment package are then brought to the farmer's house or field by truck. Projects requesting animals from Agbassa receive broken animals ready for training. The final cost of the animal includes all material charges from initial purchase--vaccination, treatment, feeds , and transport.

Planned Procedures

The TAT project will play the major role in assisting PROPTA to establish a national draft animal procurement and distribution system. AID funds will be used to construct the physical infrastructure and provide technical assistance to develop a national buying center at Tantiegou (Savanes region), reinforce the Agbassa center's functions in stock holding and transshipment, and improve the ability of PROPTA headquarters to operate efficiently as the national clearing house for draft animal ordering house, purchase, and delivery. TAT will help to develop these functions in a phased and flexible manner. This approach is necessary due to time requirements for project initiation, the creation and organization of PROPTA, and the careful development of management and administration systems. Three periods in the evolution of the new animal supply and distribution procedures need to be considered: The project's interim period of 1982-83 when activities will be focused on construction, activity consolidation, and modest expansion: full-scale project operations from 1983/84 to early 1988; and projections of some of the shifts in the structure of supply operations to be tested in 1987/88, if project objectives are achieved.

Interim Period 1982/83 (Figure 2)

This phase will basically be one of consolidation and preparation for full-scale activities. Buying methods will be much the same as at present, in that PROPTA agents will still need to travel extensively in the Savanes region to locate cattle traders and arrange purchases.

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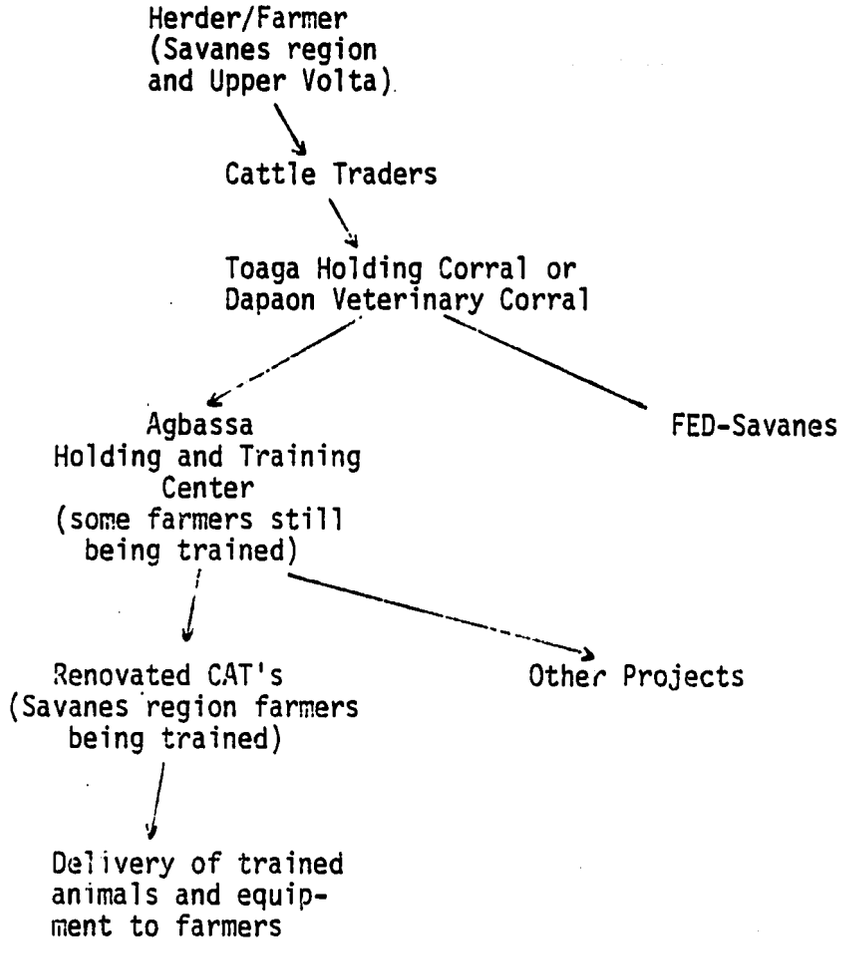
Figure 2. INTERIM PERIOD SUPPLY



However, it has already been demonstrated that traders will deliver animals to a holding corral near Dapaon once good relations are established. This trend will be encouraged. Both the Toaga and Dapaon veterinary corrals will be used to handle the higher volume of animals expected in the first year of the project. This will enable the project to bridge the gap between current holding capacity and that which will become available at Tantiegou. Cash handling procedures will be modified to increase security and to begin moving towards a checking system held at the CNCA agency in Dapaon (see the Financial Analysis in Annex 10).

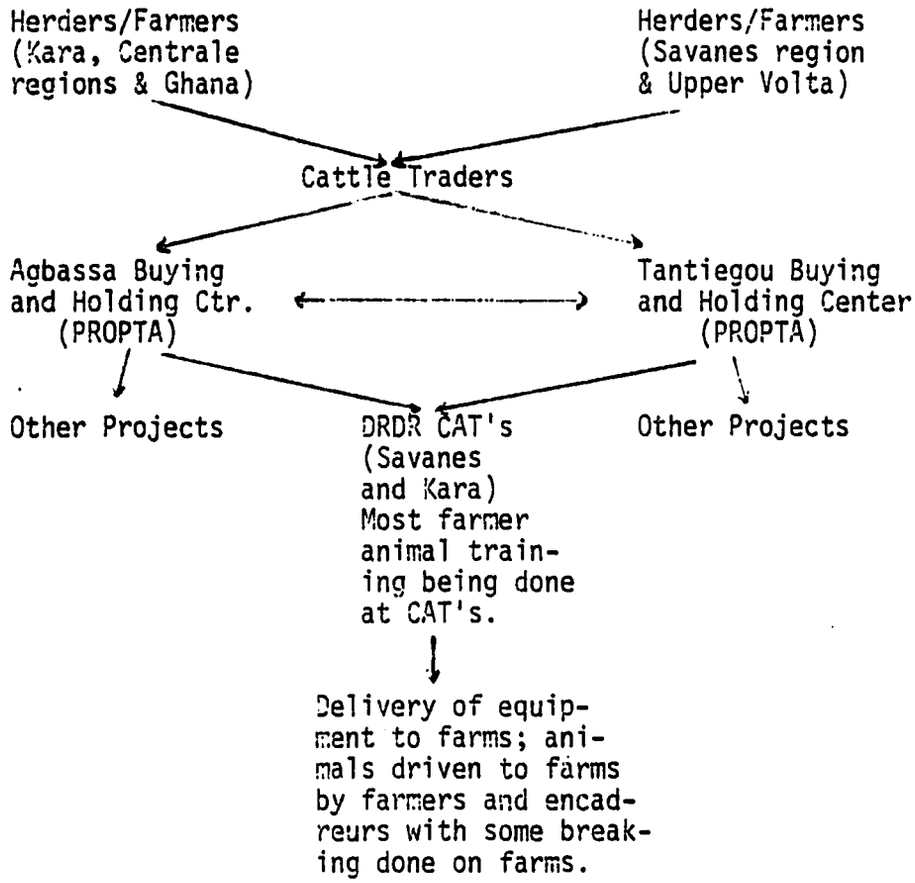
Until the construction is finished at Tantiegou, Agbassa will remain the principal holding station for cattle. It will also probably have to maintain its animal breaking and training activities until CAT operations are established. However, as early as practicable, Agbassa's role should shift from an extension support post for the Kara region to that of the southern element of the PROPTA buying system. The actual timing of this shift depends on the rates at which PROPTA's animal procurement procedures are developed, CAT's become functional, and the bridge across the Kara River to the Bassar prefecture is completed. When these conditions are met, nearly all breaking and training operations should be transferred to the CTA's.

Full-Scale Project Operations 1983/84 - 1987/88 (Figure 3)

By late 1983 the physical infrastructure and basic operating methods should be established for the national animal supply program. Both will undoubtly have to be modified during the course of the project to meet changing supply and demand conditions.

Cattle traders will probably maintain their position as the major suppliers of animals to PROPTA. The biggest changes in this relationship will be the shift of the buying location to Tantiegou (about 10 kilometers distance from Toaga), the attempt to establish a regularly scheduled draft animal market, and the adoption of a bank check purchase system to replace cash transactions. While the physical move to Tantiegou should be accomplished in 1984, both the market scheduling and check purchase system may take another year, or more, to gain acceptance. At Agbassa, the transition from regional extension support to PROPTA national functions should be complete by the end of 1984. If the Kara River bridge is completed by then (current construction plans are for completion by March 1983, although access roads may take longer), animals purchased in Kabou, Guerin Kouka and Nampoach will be transferred to Agbassa for vaccination, holding, and shipment. By the end of 1984, Tantiegou and Agbassa will have

Figure 3. FULL SCALE PROJECT OPERATIONS 1983/84 - 1987-88



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instituted a standard two-week quarantine and observation period, isolation procedures, and feeding regimes.

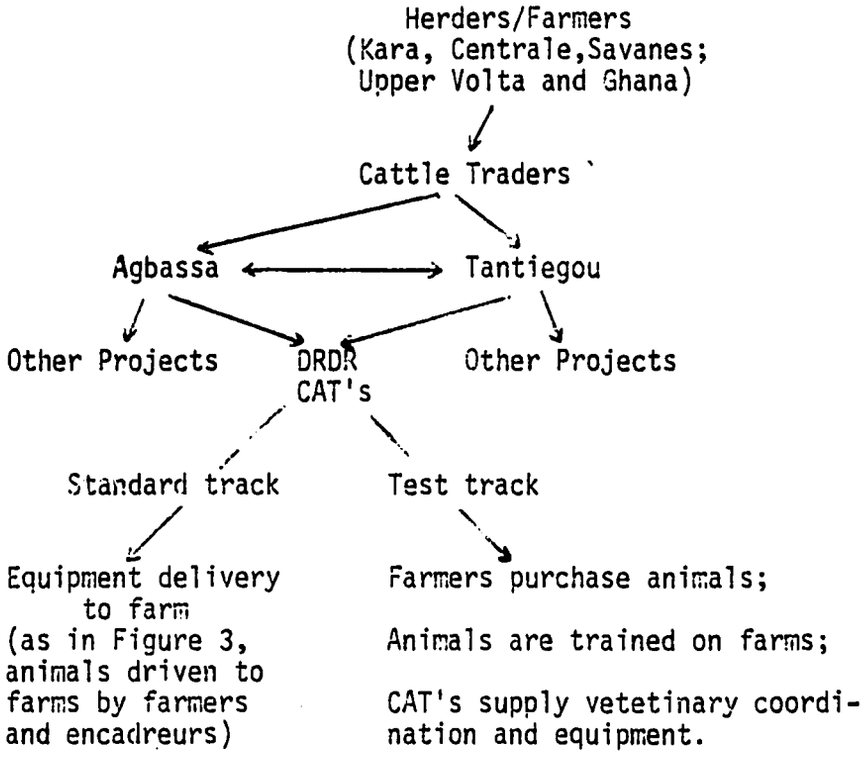
In preparation for the 1985 growing season, essentially all animal breaking and training activities will have been transferred to the CAT's. Additionally, as explained in the section on extension in this annex, farmers will be breaking and training animals at these support centers. This contrasts with the current practice of delivering already broken animals to farmers. The change has important implications for the supply and cost of supply of draft animals.

It is envisioned, for example, that many farmers will learn to break and train their animals, which will enable them to train replacements. If these farmers also can purchase replacement animals directly from herdsmen, they can save substantial mark-up and handling charges and perhaps avoid the supply uncertainties incurred when dealing with a public institution. Some individuals who are particularly skilled in animal handling will begin to train animals for a fee, if experience in neighboring countries holds true. Both of these trends, if they are of sufficient magnitude towards the end of the project, should permit a second restructuring of animal supply procedures to be tested at one or two CAT's in the Kara or Savanes regions during the last half year of the project (October 1987 - March 1988).

Testing Restructured Supply Procedures 1987/88 (Figure 4)

The second restructuring of animal supply procedures would be aimed at moving animal purchase, especially purchase of replacement animals, breaking and training, to the individual farm-level and reorganizing CAT operations to focus on support activities in veterinary follow-up coordination, new equipment delivery, farm management extension, demonstration (e.g. use of cows for animal traction, reduced tillage practices, forage crop-rotations, etc.), and possibly cattle auctions. Other than short demonstration of new techniques, farm management practices, and special group extension programs, the center should withdraw from on-site farmer training related to animal delivery. Admittedly, there are likely to be only a few CAT's at which this can be tried, but it is a first step towards weaning farmers away from public, and more costly, animal supply in order to foster the growth of private suppliers for draft animals. Tests of this approach are probably going to be possible only in the Savanes and those areas of Kara where regional herds contain animals of the desired build and size.

Figure 4. TEST OF CAT RESTRUCTURED OPERATIONS



The suggested approach may be extended to other areas, if private suppliers develop. One example of this would be equipment delivery. If UPROMA begins an outreach program to establish rural artisans (blacksmiths), it could conceivably franchise them as UPROMA sales and service agents. However, this type of activity is likely to take a decade or more to bring about.

The modifications suggested here have important implications for PROPTA. The most important one is that, where feasible, PROPTA uses its position in certain markets to promote local private operations. However, this possibility will not confront PROPTA for some time, even in locations in the Savanes and Kara regions where direct supply of draft animals to farmers by private traders has good long-term potential. It will probably take ten years before private suppliers can become dominant in the Savanes region. PROPTA could still retain this role as the national supplier of animals to the three southern regions.

The desired transformation of CAT's from animal traction promotion centers to technical support centers will also require changes in the way regional services operate. As private animal suppliers come into the animal traction market, the animal health service will have to provide initial inspections and vaccinations at the farm-level rather than at the buying center. Extension agents will have to adjust from a promotional and demonstration role to greater emphasis on crop, livestock, overall farm management, and the marketing of old animals.

In a project of 5.5 years duration it is unlikely that anything more than testing of modified supply procedures will be possible. It is more likely that even the modest restructuring discussed above would have to be put off for several years.

LIVESTOCK

ANIMAL HANDLING PROCEDURES

NATIONAL BUYING PROGRAM

The TAT project will underwrite the efforts of PROPTA to establish a national animal supply process as discussed previously. To be successful, animals of the necessary conformation, size and health status must be purchased, undergo veterinary inspection, treatment (vaccinations), and quarantine and be shipped in good condition to the various extension projects around the country. Currently, facilities available to handle animal purchase are inadequate. Individual projects purchase animals (some on their own, most through the AIP project organization) which are inspected, vaccinated and shipped to work sites as quickly as possible. The AIP has partially resolved the problem by using the Agbassa center as a multipurpose holding, training, and extension operation. However, the volume of animals to be purchased requires that government facilities be constructed at the purchase site and handling procedures regularized to avoid the greater risk of disease and stress damage that increased animal grouping entails. However, during the interim period of the project, transitional procedures will have to be employed to bridge the gap during the construction of the buying center. The following sections describe recommendations for the interim period and the full scale project activities.

INTERIM PERIOD 1982/83

As discussed under the heading of animal supply, buying activities will still carried out at Toaga and Dapaon during 1982/83. Agbassa will remain the principal transshipment point, used for holding and quarantine purposes. Changes in prescribed procedures will relate mainly to feeding, loading and transport.

Currently feeding is done through grazing available pasture, with some fodder provision during the dry season. While free pasturage will have to be continued for much of 1982/83, the greater number of animals will require the storage of fodder and feeds at Toaga. Stover and a fenced fodder enclosure already exist at Toaga. The project will regularize the supply of cotton seed and brewers grain from SOTOCO and the Brasserie du Benin by contracting for a minimum monthly supply negotiated on an annual or semi-annual basis. Fodder supply will be coordinated with the Toaga crop production activities to ensure availability of crop residues (sorghum and maize stalks, peanut and cowpea hay, etc.) Toaga will also serve as the storage

depot from which feeds and fodder are supplied to the Dapaon veterinary corral, if needed. It is not anticipated that holding time for animals will exceed one week before they are transferred to Agbassa or the larger project centers (FED-Savanes, FED-La Kara, UNDF/FAO Project North Togo).

Animals at Agbassa are grazed in and around the 275 hectares on which the center is located. During the interim year of the project, much greater use should be made of crop residues produced on the third of the surface area that is cultivated. Additionally, pasture areas should be managed for improvement. A small test plot of hybrid Bermuda grass has been established at Agbassa.[1] Following its progress through a second dry season will enable project staff to determine if it should be tested on a larger scale. The strain available produces no seed, but can be easily established vegetatively through spriggin (the harrowing of segments of a grass plant into a seed bed). The cotton seed and brewers grain contract to be established should include the needs of the Agbassa for supplemental feeding. Calculating an average holding period of 15 days with up to three kilograms each of brewers grain and cotton seed daily, will require 45 kg of each for up to 2,000 animals across the various buying and holding centers. The project budget includes funds for the supplemental feed and locally fabricated mineral (salt licks) needs.

There are some minor modifications in the way animals are currently loaded and transported by truck that would significantly reduce the shipping injury and stress that occurs with current operations. First, the corrals at Toaga and Dapaon should be improved. Basically, this would require that the chute and ramp sides be completely planked from about 15 cm from the ground or ramp floor to the top rail. This will eliminate the existing problem of abrasive bruises, and cuts that now occur when animals stick their heads through holes and get stuck. Truck gates should be modified so they can work as a vertical drop gate rather than a swinging hinged gate. Trucks now move 6-10 feet away from the loading ramps before it is possible to close the gate. While no animals have been lost during this operations, it is not worth the risk to continue this method. While all trucking of animals should occur during the cooler parts of the day, all trucks that move cattle should have tarps to provide shade and protection from rain on route and in the event of a breakdown. Finally, all animals should be deticked before shipment to other holding stations or projects.

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[1] Personal communication by Dr. Murray Brown of Sam Houston State University, Texas.

FULL-SCALE PROJECT ACTIVITIES 1983/84-1987/88

The shift in national buying activities from Toaga and Dapaon to Tantiegou will permit better standardization of handling practices. The physical infrastructure has been designed to permit easy flow of animals from purchase through shipment. See Figure 7 for the physical plan of the buying center.

Animals purchased at the center will be ear-tagged and held in the receiving/shipping corral for veterinary inspection. They will then be driven either into the pasture areas or through a spray race for deticking. For management purposes, up to 40 animals will be grouped to form a lot kept separate from the other lots for a two-week quarantine and observation period. Animals which develop diseases will be separated from the lot and held in the isolation corral for treatment or culling. Towards the end of the two-week period the lot will be vaccinated and deticked, if necessary.

Animals will be grazed in six 6.25 hectare pastures on a rest-rotation cycle that will have to be developed by the livestock specialist. This surface area is insufficient in and of itself to support a weekly maximum 120 head of cattle averaging 175 kg each. This size herd is equivalent to 84 tropical animal units (A.U.) of 250 kgs each. Rainy season bottom land pasture can usually support 6.33 A.U.s/hectare. This would indicate the need for 255 hectares of pasture land, which is not available to be fenced in the project area. However, the project seeks animal maintenance with only modest if any weight gain during the quarantine period. Through a program of free grazing, night or partial day grazing in the fenced pasture, and feed supplements, animals should be maintained in good condition. During the dry season, however, significant amounts of fodder will be required on a regular basis. While initially it will be possible to use the residus from surrounding seed multiplcation and production fields, by the third or fourth year of the project the livestock specialist and agronomist will have to establish fodder production fields near the buying station.

LIVESTOCK

ANIMAL HEALTH CARE

The basic precondition to the successful use of draft animals in the tropics is maintenance of animal health. In Togo, the main health preventions that must be taken with draft animals vary from north to south. Thus, animal traction projects will have to vary their health care programs to meet the different intensities of disease and parasite challenges found across the country. To do this, significant improvements will have to be made in the way veterinary services are supplied.

At present, most veterinary work is based on vaccination campaigns, inspection of purchased lots of livestock on their way to major meat markets, or interventions at the farm level when acute illness occurs. At such times a health control report (Fiche Sanitaire de Controle - see Figure 5) written up by the agent from the Department of Veterinary Services and Animal Health (DVSA). While Togolese veterinarians and veterinary agents are well trained, the existing system for animal health follow-up does not meet the needs of an animal traction program for two reasons. First, it does not ensure regular treatment of individual animals. Secondly, an animal insurance program will require proof of adequate treatment to justify animal replacement or demonstrate farmer negligence. Consequently, the TAT project will install a health care system to be used with all animals destined for use in the DRDR extension programs in the Savanes and Kara regions.

HEALTH CARDS FOR DRAFT ANIMALS

The health card system will begin at the time animals are purchased for the Savanes and Kara regions' animal traction program. All cattle purchased will be vaccinated, deparasitized, and given an initial prophylactic trypanosomiases treatment. TAT extension cattle will be assigned a numbered record sheet in triplicate to be used to track treatments. This card will provide a central record for an individual animal until death or sale occurs.

When the animal is sold to a farmer, part of the farmer's down payment will be used to cover scheduled veterinary interventions and an insurance premium. Each animal the farmer acquires will be accompanied by a durable health card with detachable tabs listing the types and number of treatments to be done that year. Veterinary agents will sign and date the card and the tab, removing the tab

which, should the need arise, be cross-verified with the card. The animal health card remains with the farmer. The tabs will be filed with the central record sheets for the animal kept by the concerned DVSA office. Additional copies of the record sheet will be held at the CAT and the DRDR headquarters with summary sheets sent to the PROPTA office in Kara. New health cards will be issued each year as part of the farmer's annual loan repayment.

In the event of an animal's death, an inquiry committee including the local veterinary agent, sector extension chief, and local field extension agent, will determine the cause of death. Treatment records will be examined to determine if negligence is assignable to the farmer or the Veterinary Service. If the farmer is proven negligent, all outstanding loan obligations remain in force, and the farmer must bear the cost of a replacement animal. Should cause of death be accidental, e.g., snakebite, or the Veterinary Service shown to be negligent, e.g. failure to vaccinate or treat, then the insurance clause of the loan contract will go into effect and the project will replace the animal.

Initial purchase of veterinary supplies and vaccines will be financed by the project for the DRDR extension programs in the Savanes and Kara regions. As the health cards will be purchased as part of the loan down payment and repayment schedule, farmers will be prefinancing the purchase of drugs, vaccines, antibiotics, etc. This will enable the offices of the DVSA to carry out the required field work in coordination with the DRDR extension personnel.

Health cards will have four categories of treatments: vaccinations, deparasitization, anti-trypanosomiasis treatment and special interventions. Sample cards for a northern, fairly light disease challenge zone and a more southerly, more stressful zone are given in Figures 6.A. and B.

For at least the initial two years of the project, the treatments placed on the card should be based on the recommendations of the regional and livestock sector veterinarians on the DVSA. The central registry and health card system will permit the monitoring of disease and parasite incidence and subsequent modification of cards during the latter half of the project. Some vaccinations may be excluded from the animal health card if they are routinely given to all animals at the buying stations or in national campaigns. Substantial changes in the cards should be expected over the life of the project as health practices for draft animals become standardized in zones of different disease and parasite challanges.

Part of the scope of work for the livestock specialist will be to carefully monitor the health card system and evaluate and modify it in collaboration with other project and DVSA staff. The ultimate

objective is to develop a follow-up system which maintains good animal health in a cost-effective manner in the central animal registry. Properly analyzed by the livestock specialist and Togolese colleagues, this information will feed into PROPTA's Monitoring and Evaluation Unit. Here, the information will be used to guide national discussion on veterinary intervention for draft animals.

FARM LEVEL ANIMAL CARE

Many health problems can be avoided through simple measures taken by farmers. To ensure that the basics of shelter, food and water are respected, farmers will be required to construct a simple shelter using local materials and equip it with a water container or trough before animals are delivered. During training with the animals, farmers will be taught how to maintain a clean shelter, provide adequate water, and assure the right fodder and feed. Extension agents will be expected to monitor the status of these basic conditions during their visits. In addition, extension agents will demonstrate to farmers simple treatment for wounds and bites, deticking, and first aid for more acute trauma such as lacerations, sprains, bone and sheat damage, etc. The extension agents will learn these skills, and how to pass them on, during training sessions, supported under the project.

ZOONOTIC DISEASES

Cattle and humans overlap in their susceptibility to a range of diseases and parasites and can communicate them either directly, by serving as a host reservoir for a pathogen or parasite carried by an insect vector, through consumption of contaminated milk, meat, or hides, and contact with contaminated wastes. The Division of Veterinary Services and Animal Health is aware of most of these problems. It retains the chief responsibility for inspecting imported and local animals entering the meat market or being shipped to other regions.

For the TAT project, veterinarians from the DVSA will inspect all animals for communicable diseases such as anthrax and tuberculosis. Design team discussions with veterinarians indicate that tuberculoses is rare in Togolese herds. Periodic visits by veterinary agents to treat cattle under the health card system will enable them to check for symptoms of this disease and others, such as tetanous.

As the early stages of the project will deal mainly with bullocks and bulls, the chance of brucellosis infection will be low. If and when cows some into use and brucellosis incidence appears significant, vaccinations should be carried out. The DVSA has indicated no evidence of problems with late-term abortions in herds in the Savanes and Kara regions. Basic shelter sanitation can go a long way in avoiding communication of this disease.

Senior GOT officials are very cognizant of the potential human health hazards of the increased proximity of animals to farmers that is a pre-requisite for the effective introduction of animal traction. Trypanosomiasis (sleeping sickness) is the principal concern, but recognition is also given to the potential cross contamination by intestinal worms and clostridial,salmonella, and coccid bacteria. In the case of sleeping sickness, the TAT project's regular treatments to suppress trypanosomes in the cattle will afford a measure of protection to the cattle owner. It has been proposed by the officials in the GOT, and the design team heartily concurs, that coordination between the TAT project, PROPTA, and the public health services should be initiated.[1] This coordination should probably take the form of epidemiological monitoring of animal traction farmers as a new risk class and the involvement of public health staff in the preparation of training and extension materials to help reduce the risk of zoonotic disease transmissions. Also, the best way to avoid these problems is to combine good animal inspection and health procedures which include sanitation measures. Fortunately there are potentially strong economic incentives for the latter. Good sanitation practices include the development of manure composting procedures which can contribute to soil fertility, as well as reducing disease problems.

The livestock specialist will work with PROPTA and DVSA staff to develop the needed links with the public health services.

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1) Letter from Dr. G.Salami, principal technical advisor to the MRD, to OAR/Lome. 12 July 1982.

Figure 5

DIRECTION DES SERVICES VETERINAIRES
ET DE LA SANTE ANIMALE

Republique Tunisiaise
Unis-Paix-Solidarité

REGION D'ELEVAGE DE .....
CIRCONSCRIPTION DE .....

FICHE SANITAIRE DE CONTROLE

CANTON .....

TROUPEAU N° ..... RACE .....

VILLAGE .....

Nom du Responsable du Troupeau .....

DATE DE LA VISITE ET NOM DE L'AGENT	NOMBRE DE TETES	ENTREES			SORTIES				TOTAL	INTERVENTIONS ET OBSERVATIONS
		Nés	Achetés	Transférés	Abattus	Vendus	Morts	Transférés		
	Taureaux Vaches Boeufs Tourillons Bouvillons Génisses Veaux Veles									
	Taureaux Vaches Boeufs Tourillons Bouvillons Génisses Veaux Veles									
	Taureaux Vaches Boeufs Tourillons Bouvillons Génisses Veaux Veles									
	Taureaux Vaches Boeufs Tourillons Bouvillons Génisses Veaux Veles									
	Taureaux Vaches Boeufs Tourillons Bouvillons Génisses Veaux Veles									
	Taureaux Vaches Boeufs Tourillons Bouvillons Génisses Veaux Veles									
	Taureaux Vaches Boeufs Tourillons Bouvillons Génisses Veaux Veles									

Figure 6.A Sample Health Card Low Disease / Stress Area

DRAFT ANIMAL HEALTH CARD

Animal Central Registry No _____ Owner _____

Eartag No _____ Location _____

Treatment	Agents Name and Signature	Date of Treatment	Treatment Stubs
A. Vaccinations			
Rinderpest			Reg.No. Date: Signature: Rinderpest
Bovine Pleuro-pneumonia			Reg.No. Date: Signature: BPP
Anthrax			Reg.No. Date: Signature: Anthrax
Blackleg			Reg.No. Date: Signature: Blackleg
B. Deparasitization			
Internal Worms # 1			Reg.No. Date: Signature: Worming # 1
Internal Worms # 2			Reg.No. Date: Signature: Worming # 2
C. Trypanosomiases			
Antitryp # 1			Reg.No. Date: Signature: Tryp # 1
Antitryp # 2			Reg.No, Date: Signature: Tryp # 2
D. Special Treatments			
Pineye			Reg. No. Date: Signature: Pinkeye

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Figure 6.B Sample Health Card High Disease / Stress Area

DRAFT ANIMAL HEALTH CARD

Animal Central Registry No _____ Owner _____

Eartag No _____ Localite _____

Treatment	Agent's Name and Signature	Date of Treatment	Treatment Stubs
A. Vaccinations			
Rinderpest			Reg.No. Date: Rinderpest Signature:
Bovine Pleuro-pneumonia			Reg.No, Date: BPP Signature:
Anthrax			Reg.No, Date: Anthrax Signature:
Blackleg			Reg.No. Date: Blackleg Signature:
B. Deparasitization			
Worming # 1			Reg.No, Date: Worm.# 1 Signature:
Worming # 2			Reg.No. Date: Worm.# 2 Signature:
Worming # 3			Reg.No. Date: Worm #3 Signature:
Worming # 4			Reg.No. Date: Worm # 4 Signature:
C. Trypanosomiasis			
Antitryp # 1			Reg.No, Date: Tryp. #1 Signature:
Antitryp # 2			Reg.No, Date: Tryp.# 2 Signature:
Antitryp # 3			Reg.No, Date: Tryp.# 3 Signature:
Antitryp # 4			Reg.No. Date: Tryp.# 4 Signature:
D. Special Treatments			
Pinkeye			Reg.No. Date: Pinkeye Signature:
Mange/ Acaracide			Reg.No. Date: Mange Signature:
Ticks # 1			Reg.No. Date: Ticks #1 Signature:
Ticks # 2			Reg.No. Date: Ticks #2 Signature:
Ticks # 3			Reg.No. Date: Ticks #3 Signature:

LIVESTOCK

PILOT HERDS

In the discussion on animal supply above, it is noted that a current herd growth rates the supply of young male animals will be saturated by the demand for replacement animals in about ten years time and that due to the strength of internal and external markets for meat, it should not be expected that very large numbers of animals will be available from neighboring countries. The result of this line of reasoning is either that Togo pays the price of increasing imports of meat or that it develops increased animal production capacity. As a study on meat marketing in Togo concluded, the country will have to do both for at least fifteen years due to the rate of growth in meat demand, the natural delay for animal production projects to have an impact on national supplies, and the rather slow implementation of animal production projects that has taken place in Togo.[1]

To date, essentially all animal production projects have been moderately or heavily capital intensive. Animals have been taken from extensive herds and placed on fenced, improved pasture generally Panicum maximum or Brachiaria, within ranches, e.g., Avetonou, Adele, Niamele. While these herds may eventually provide a system for raising and fattening beef cattle for urban markets, the extensively managed herds will continue to be the main source for draft animals in the foreseeable future. While it may not be a significantly faster process, to improve extensive herd productivity, the potential for more cost-effectively increasing productivity exists and should be explored by the projects.

One of the principal voids in the PP team's information gathering was data on tradional herd structure and management practices. While it is hoped that the 1982-83 agricultural census will help to fill in some of the gaps, it is clear that the project will have to take an active, if limited role, in pursuing questions about improvement in traditional herds.

Part of the livestock specialist's responsibility will be to review available date from the census and determine, with the assistance of the PROPTA monitoring and evaluation unit, how to select and follow-up a sample of herders in order to describe herd structure, growth characteristics, and production constraints.

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[1] Josserand, 1979. pp.99-112.

In addition, to gain some insight into the health, simple selection, and grazing management interventions that might be applicable to extensive herding conditions, the project will initiate work with two small pilot herds of cattle at Agbassa and Tantiegou.

The Accelerated Impact Program activity originally contained provision for the development of a pilot herd, but both start-up difficulties and lack of expertise hindered its implementation. At the moment, Agbassa has 20 cows which have been bred. However, beyond health treatment, other considerations such as records on weight gain, feeding regimes, calving rated, etc., have yet to be established.

During the transitional year of the project (1982/83) it cannot be expected that significant work can be done with the Agbassa herd of cows. At a minimum, however, cow and calf histories should be maintained. During the second year of the project, the livestock specialist will complete the Agbassa herd structure based on an initial analysis of DVSA and agricultural census data and establish a herd record keeping system. During the third year of the project, once Tantiegou operations are consolidated, a second pilot herd will be established there.

As the basic purpose of the pilot herds is to learn how to improve extensive herd management, practices will be purposely limited to low capital requirements. Basic health care will be assured for the two herds, which may be a major key to increasing production[1]. Special attention will be paid to the question of dry season grazing and animal maintenance. The reports received from farmers, herders and animal health and production staff all indicated that this was a key problem in economic (animal weight loss), social (conflict with herders over reported loss or theft of animals), and technical (poor control of breeding) terms. These concerns are basic to animal husbandry, but essentially unexplored. The two pilot herds proposed here will be the only carefully monitored, extensively managed herds in Togo. The data generated will provide the first step towards a comparative look at potential returns from low capital investment approaches to increasing herd production in Togo.

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[1] Sollod, 1981. pp.29-37.

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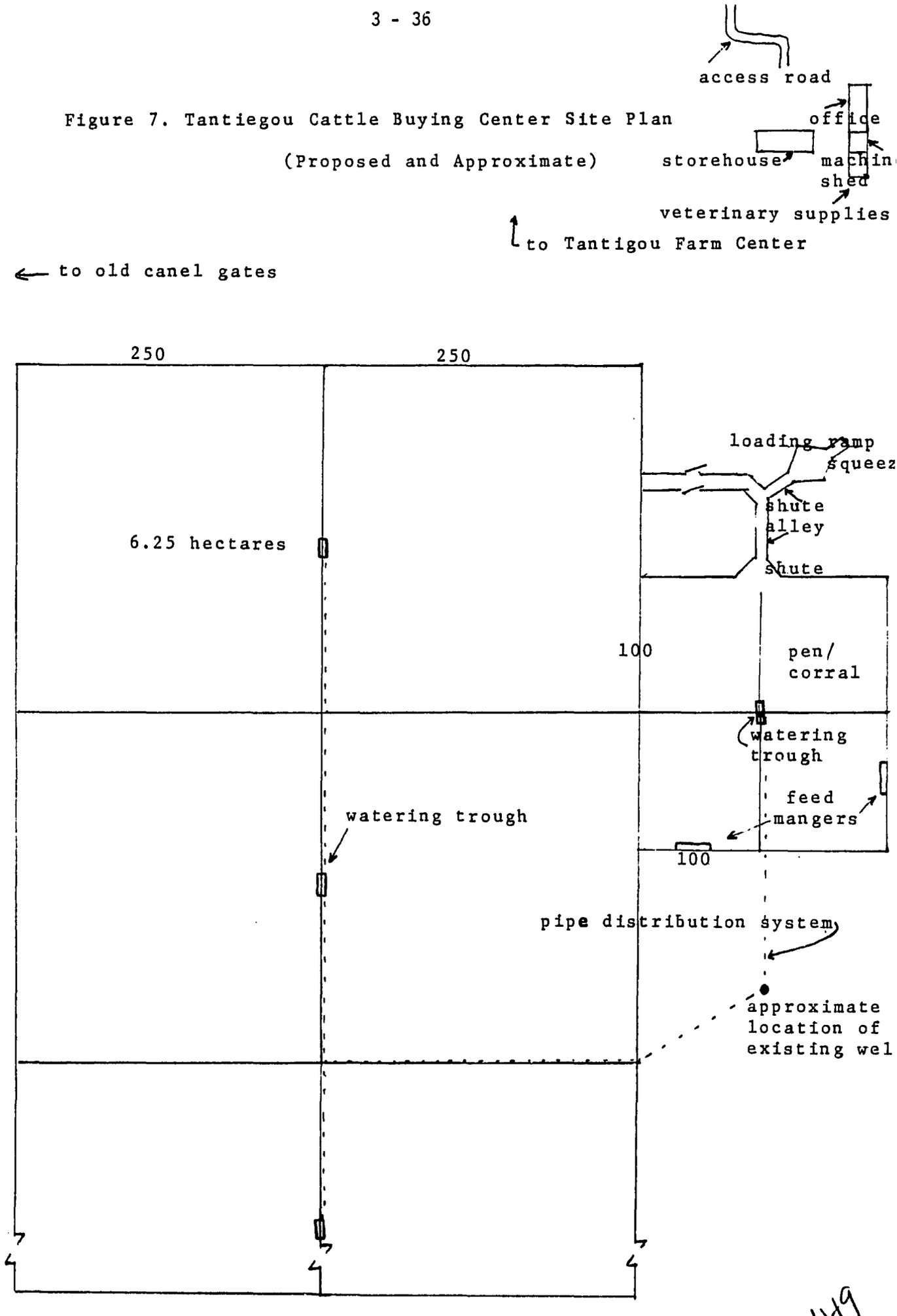
Figure 7. Tantiegou Cattle Buying Center Site Plan

(Proposed and Approximate)



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ANNEX THREE

TECHNICAL ANALYSIS

EQUIPMENT

One of the major debates going on about animal traction in Togo, is what types of draft tools should be included in the implement package to be extended to farmers. At the moment, most projects have developed a standard tool set based on selections from the following elements: a multipurpose tool bar which can be equipped with an eight-inch moldboard plow and ridger, a five-tined weeding triangle equipped with "Canadian" shovels and chisel teeth, a spike-tooth harrow, a one-row planter, peanut lifter blades, and a two-wheel cart. Almost every project has a different conception of which elements must be contained in an extension package to work. Unfortunately, there has been little formal monitoring of on-farm equipment use to guide selection. However, one general consensus is that the single-row planter is too expensive for the limited use it would receive in a growing season. While the planter model used is manufactured in Upper Volta and Senegal with a variety of seed plates, only the groundnut plate has been made available with the units imported to Togo. To be used for maize crops, seed holes in the plate have been blocked with wax to permit wider spacing of hills. Of course, even this modification does not permit the planter to be used to sow small seed grain.

Despite its current inutility, the planter serves as a good specific example of the more general problems across the equipment packages: The failure to match the elements of the packages with an understanding of either the constraints to crop production in the different farming zones of the country or the ability of farmers to undertake the debt burden of a pair of animals and equipment. The following discussion deals with the problem of matching equipment packages to the farming systems in the project zone. The Economic Ananlysis in Annex Two discusses the financial implications of the equipment package.

TOOL MIX

As discussed in the section on crops, there are two major operations which are holding down productive utilization of existing soil and water resources. These are land preparations during the early part

of the growing season and weeding throughout the season. This statement indicates that primary tillage tools and weeding implements should comprise the initial package. However, this does not imply that all farmers need or should obtain all of the tillage equipment. Experience to date suggests that much of the equipment delivered remains inutilized or underutilized. This situation is most likely due to an introduction of equipment before a farmer knows how to use it in the cropping systems, or to farmers who have no perceived need for the tool. The primary example of such and unused piece of equipment is the weeding triangle. Despite its potential utility, unless a farmer plants in rows and is shown how to make and adjust a long yoke for a team of animals, the weeder is unlikely to be used for cultivation. Nowhere did the PP team actually observe a weeding triangle in use and only a few projects indicated that some farmers have been using it. The most frequent occuring example of no need for a tool is observed with farmers who receive a spike-tooth harrow, but who grow most of their crops on ridges. However, neither of these examples can or should automatically eliminate these tools from consideration in an animal traction project. They do, however, point up the need for extension personnel and project technicians to view the available equipment as production means which must be selected to fit the production ends a farmers has in mind. In the case of the weeder, an extension effort will be required first to demonstrate the yield difference that timely weeding can make. Secondly the farmer should be trained to make effective use of the implement by modifying planting arrangement and adjusting shovels to obtain good weed removal with little crop root damage. In the case of the spike-tooth harrow, its technical viability will probably be dependent on site selection. Where it is used extensively now, i.e. by farmers working with the GTZ project around Sokode, crops are already grown on the flat and farmers use the harrow as a land-preparation and weeding tool. After plowing, planting is delayed until weeds have germinated. The spike-tooth harrow is then employed to knock down the weeds and prepare the seedbed. While this delays planting and probably reduces yield, it may have a positive effect on labor productivity.

In sum, tool selection has a ripple effect throughout farming operations which should not be ignored. The PP team believes that the interdependencies have been overlooked by many projects in an attempt to get animal traction going. As the Economic Analysis (Annex Two) suggests, pushing equipment at farmers faster than they can adapt it, is more likely to hinder than promote animal traction at the village-level.

While greater attention should be paid to adjusting equipment packages to meet individual farmer needs as described above, there are some general environmental considerations that tend to suggest the elements of a basic tool set.

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Research elsewhere in West Africa has stressed the advantages to water conservation and date of planting of end-of-season deep plowing.[1,2] However, several factors limit this approach in northern Togo. The long-cycle and late-planted crops are harvested after the soils have dried and hardened. Available animals are generally too light-weight and the plows too small to do a very effective job under these conditions. At the other side of the dry season, soils are harder still. While farmers can wait to plow until soils soften up, this, may delay early plantings to later than optimal dates. These facts suggest that scarification using the chisel tines on the weeding triangle may enable farmers to take advantage of the early rains. Use of the triangle in this manner, along with the potential benefits of early weeding, argue strongly for inclusion of the weeding triangle in the equipment package in areas where flat cultivation is practiced or practicable. While this might imply a reduction in the importance of the plow in the equipment package for early land preparation, both the plow and ridger are used extensively by farmers for late land preparations where heavy weed growth has already occured. It is unlikely that attempts to reschedule farm operations to carry out early land preparation on a whole farm basis will be successful in the near term. So, the plow will have to be retained with the ridger as basic equipment package elements. This is probably also justified based on long-run intentions to introduce forage follows which would have to be turned under with a plow when the land returns to the cropping cycle.

Farms on shallow soils containing high laterite gravel or "shot" content, probably should not use the moldboard plows. Fields in this category were observed to suffer greater clay and loam fraction loss under plowing than under hand hoeing in parts of the Bassar prefecture. If extensive land preparation is undertaken on these soils at all, a more reasonable approach would be to establish ridges and band tie them. The PP team's general recommendation is that the initial equipment package include the weeding triangle and tine sets, the ridger, and the plow. From this base, additions or delations should be based on an understanding of the individual's farm management practices and soil conditions.

EQUIPMENT MANUFACTURE

Equipment manufacture for animal traction has been standardized with the opening of the UPROMA (Unite de Production de Materiel Agricole) factory in Kara in 1981. The equipment designs are based

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[1] Charreau and Misou, 1971.
[2] Gaudefroy-Demeunbynes and Charreau, 1961.

on those of ARCOMA (Atelier Regional de Construction de Materiel Agricole) in Upper Volta. At present UPROMA is funded under the CNPPME (Centre National de Promotion de Petites et Moyennes Entreprises) program of UNIDO (United Nation Industrial Development Organisation). The equipment produced is lightweight and adapted to the pulling ability of the West African short horn animals available in Togo, The equipment is easy to assemble and maintain with only simple tools.

Some problems exist with the supply of basic manufacturing materials. This has led to a requirement that all projects prefinance equipment manufacture. The TAT project deals with this problem in the Financial Analysis (Annex Two).

SPARE PARTS, REPAIRS AND RURAL ARTISANS

The TAT PID suggested that a component of the proposed project would be the development of a spare parts manufacture and parts supply capacity through training and equipping of rural artisans. During the project design process it was discovered that Project North Togo has already established a very well-organized blacksmith training program and that UPROMA is planning to initiate its own training and outreach program. In addition, Projet FED-Savanes has recently created a machinery assembly and training workshop at Tantiegou which will provide equipment and repair skills for much of the Savanes region. In the light of these important developments on the part of other major donors, it was decided that AID support is not required for this sub-activity.

ANNEX THREE

TECHNICAL ANALYSIS

CROPS

As the Social Soundness Analysis explains, the project area is a patchwork of ethnic groups. The diversity of cropping systems and the types of links between crop and livestock activities varies considerably as well. However, for purposes of this analysis the two northern regions have been divided into two zones, the root crop zone and the cereals zone. The root crop zone extends from the Bassar prefecture north to the town of Gando. The cereals zone extends from Gando north to the border with Upper Volta.

In the root crop zone, yams are a significant component of food crop production. They are the dominant root (tuber) crop except for areas at the extreme north and south of the zone where cassava is also well-established. In upland areas, cowpeas, peanuts, maize, and/or sorghum are cultivated as intercrops on and around the yam mounds. In bottomland areas, rice will often appear as an intercrop among the mounds. The slopes of these mounds are also intercropped with cereals and pulses.

In the cereals zone, root crops drop out of the cropping pattern. As most of the cereals zone receives less than 1000 mm of annual rainfall, it is a marginal zone for yam production. Few yam fields are found beyond Gando and Mango. However, there are favorable climatic conditions for cassava, but this root crop is limited to small household gardens. The reason given by most farmers and field staff for this phenomenon was that both domestic stock and wildlife heavily attack both the foliage and the roots of cassava, which remain succulent during the dry season.

Besides the root crop difference, the major crop distinction between the cereals and root crops zones is the larger field size in the former. Stands of bulrush millet and 4-6 month sorghum were observed to cover from 60 to 100% more surface area in the cereals zone. More farmers were observed to grow maize and rainfed rice in the cereal zone than in the root crop zone, and field size for these crops was again greater. Cowpeas were a frequent intercrop in cereal stands along with peanuts, which were also grown in pure stand in many areas.

Cotton is grown in both zones under the direction of SOTOCO encadreurs. In the old Kara region very little cotton was formerly grown. Now that the Bassar and Assoli prefectures have been added to the region, cotton must be considered to be an important cash crop. The surface area devoted to cotton decreases across the root crop zone, then increases again in the cereal crop zone. Due to the presence of fewer pests, the seed from cotton produced in the Savanes region is distributed as the next season's seed across much of the country.

Besides the above annual crops, farmers in both zones make extensive use of fruit and pod bearing trees (shea nut, nere, baobab, ficus spp., etc.).

The implications for animal traction of the differences between the two zones are important. The root crop zone will always have a component of its cropland which cannot be fully prepared with animal drawn implements. No animal drawn equipment has been designed that can move the volume of earth needed to prepare the large mounds (0.5-1.4 meters high) used for yam or cassava production. As yam fields make up substantial proportions of farms, especially when the farms are small, the implication is that only farmers with larger fields are likely to obtain the full benefits of labor efficiency from the use of animal traction. On the other hand, in the cereals zone most farmers have the potential to employ animals on all of their cultivated surface area. However, the cereals zone is drier than the root crop zone and also has greater rainfall variability. Larger farm sizes will be needed in the cereals zone to make the use of animal traction profitable. These circumstances and field observations of field size and cropping patterns have led to the development of two basic crop models which are used for the calculations presented in the economic analysis in Annex Two. These models are presented in the following two Tables.

Table 1. Crop Model for the Root Crop Zone
(Gando south to Bassar and Assoli prefectures)

Crop/Intercrop	Surface Area (ha)
1. Yams (with a minor cassava component) and cowpea intercrop	0.5
2. Bulrush millet with cowpea intercrop	0.4
3. Sorghum in mixed maturity stand	1.4
4. Maize	0.2
5. Peanuts	0.3
6. Cotton	0.2
7. Rice ?	?
TOTAL	3.0 *

Notes to Table 1.

* The three hectare base is a rough average estimated by the team. It incorporates the effect of larger individual holdings in Bassar, Bafilo, and Gando areas on the average farm size across the zone where root crops are important.

1. Except for small areas at the extreme south and north of the root crop zone, yams dominate the root component of farms. In dryland areas, cowpeas, peanuts and/or sorghum are intercropped on and among yam mounds. To simplify calculations in the economic analysis, cowpeas were chosen to model the intercrop. In bottomland areas, rice will often appear as an intercrop with the yams. Given the lack of even rough estimates of bottomland availability it was not possible to assign rice as an intercrop.

2. Bulrush millet is a 60-70 day set of cultivars often intercropped with cowpeas. In some areas, farmers intercrop with 4-6 month millet or relay crop with mixed maturity sorghum. The latter combinations were excluded from the economic calculations for ease in manipulation in the economic analysis.

3. The sorghum mixed maturity stands (4-6 months) may also be partially intercropped in some areas with millet, cowpeas or peanuts.

4. For most of the root crop zone, maize is used as an early roasting food and does not cover large surface areas. The Bassar prefecture is an exception to this generalization, but the impact of the inclusion of this area does not substantially raise maize area throughout the zone.

6. The inclusion of cotton reflects the intensive extension program of SOTOCO in Bassar, Kante, Broukou, and Gando areas. The TAT project is lending no direct support to the cotton extension efforts, although it can be expected that animals will be used to prepare land and hill cotton rows. There is no feasible way, nor would it be desirable, to attempt to remove cotton from farmer's rotations.

7. Rice cultivation will replace some sorghum or maize area where bottomland is plentiful, e.g., Tamberma country.

Table 2. Crop Model for the Cereals Zone
(Gando north to the Upper Volta border)

Crop/Intercrop	Surface Area (ha)
1. Bulrush millet with a cowpea intercrop	0.7
2. Sorghum intercropped with 4-6 month millet	2.0
3. Maize	0.3
4. Peanuts	0.4
5. Cotton	0.3
6. Rice	0.3
TOTAL	4.0

Notes to Table 2.

1. In some parts of the cereals zone, double cropping is attempted with 4-6 month millet and transplanted sorghum, following an early 60-day millet crop.

2. Sorghum fields, particularly those planted late, will contain a range of cultivar maturities, as well as the millet intercrops. Staggered planting is also common. These practices can be seen as accomodating the high rainfall variations in the zone. No attempt is made here to factor these practices into the economic analysis.

3. Maize use is similar to that further south in the root crops zone, but a larger proportion of the crop is grown and stored for dried grain.

5. SOTOCO farmers average about 0.5 hectares of cotton per family. This figure was discounted across the farming population to obtain an average figure for the zone.

6. The cereals zone possesses many small valleys, especially in the eastern and southern reaches. As these are areas of concentration for planned Savanes regional extension effort, rice is included in the farm model. In drier parts of the zone, this surface area would be replaced by other cereals.

Given the results of the economic analysis reported in Annex Two, and the observations of the members of the design team, it is believed that animal traction extension efforts should use the total surface area figures developed above as screening criteria for farmer selection. Over the near and medium-terms, working with farmers who have smaller holdings would be ineffective and likely to lead to high default rates on loans.

Given these general observations on the cropping patterns and crop models for the two major zones in the project area, and specifications for the minimum farm sizes with which the project should be working, the question now becomes one of determining what to do at the farm level in terms of agronomic practices that make the best use of the available animal traction power source and crop production technologies. The following sections address these questions under the rubrics of

- agronomic practices,
- fertility maintenance,
- rotations, and
- agroforestry.

Agronomic Practices

One of the principal difficulties with animal traction projects is that antrac introduction to the small farmer becomes an end rather than being handled as a means, i.e., a production input which needs to be adapted to differing individual farm contexts. Even more disappointing, is the representation of animal traction as ox plowing. Not only does this make poor economic sense from the perspective of optimizing the use of available resources, but it makes even worse sense from an agronomic perspective. The increase in available farm power for tillage and cultural operations opens up the possibilities for much better utilization of available rainfall, total potential growing periods, and land area, as well as economics in labor use. The discussion below points out some of the potentials for better utilization of draft power and some of the variations in equipment use and cropping practices that should not only be expected but actively encouraged in the course of this project.

Land Clearing

Animals in Togo are too small to be effective in the removal of stumps from newly cleared fields. In the past, government and donor projects have opted for mechanical clearing of farms using bulldozers. However, this method is both extremely costly and on many of the soils in Togo leads to removal of the already shallow layer of available topsoil. Past evaluation of the impact of mechanical clearing of land has recommended that most clearing operations continue to be done by

hand (Humpal et al. 1980. p.53-57; Humpal et al. 1981. p.37). How effective aids to hand clearing can be, will need to be explored during the first years of the project. The project budget contains funds for the purchase of monkey winches ("come alongs") to be tried. The CAT's should be the first locations for these tests to be carried out by the extension field staff.

It should be noted that under no circumstances does the project intend to promote removal of all trees from fields. In the first case, there are species which are protected by Togolese law (karite, nere, and others). Secondly, food and other products are obtained from both protected and unprotected species. Thirdly, animal teams can easily work around up to about 10 trees per hectare without substantially reducing efficiency in operations. Also, since the project will be encouraging the improvement of field fallow with leguminous forage plants, the trees will be useful sources of shade for grazing animals.

Plowing and Primary Tillage

There has been substantial debate in West Africa and elsewhere about the advantages and disadvantages of deep plowing as opposed to reduced tillage operations. In areas where rainfall is limited, either on an annual basis or due to rainfall patterns throughout the growing season, the debate usually focuses on the effects of tillage on soil water. Proponents of deep tillage using moldboard plows point to studies showing that tillage-induced hydraulic roughness increases infiltration rates (Charreau, 1978) or provides extra void space which increases detention storage of rainfall (Henderson, 1979, p. 227). Proponents of reduced tillage approaches advance studies which show that many of the purported deep tillage advantages are extremely short-lived and less effective than stubble mulch and minimum tillage approaches in environments of high rainfall intensity (Parr and Bertrand, 1960). Reconciliation of the differences in observed tillage effects on water infiltration and detention is usually based on more detailed examination of the soil characteristics and interactions with other tillage effects not directly related to water balance (Charreau, 1974, p. 224-230).

Inspection of fields in the project area and meetings with officials from the Soil Survey Service indicate that the physical properties of many of the oxisols in the project area conform to what Charreau would call "structurally inactive" soil conditions that would benefit from deep tillage and/or increased surface roughness (Charreau, 1974, p. 224-230). However, the shallow nature of many of the soils, the fact that many of them contain high quantities of lateritic "shot" or gravel, and the existence of high impulse rainfalls at the beginning of the rainy season suggest that a general recommendation of deep tillage cannot be done without reference to the soils on a locality basis.

Where lateritic "shot" and shallow soils are abundant, moldbord plowing is likely to lead to increased mixing of "shot" from lower layers with the upper portions of the soil horizon. High impulse rainfall is

likely to cause substantial rainsplash erosion and the progressive loss of finer elements (clay and silt). This process was already evident on some regional production farms that had carried out intensive tractor drawn disc-plowing over a two year period. While deep sub-soiling would avoid this problem, there is insufficient animal draft power to carry it out.

In areas with these types of soils, the project should seek to develop less intensive tillage methods. One approach may be to establish ridges which would be split every year to form a new set of ridges and furrows. This would limit the depth of tillage, avoiding the mixing of shot with the upper soil layers, turning under any late season weed growth from the year before, and improving surface roughness characteristics.

In areas where soils are structurally stable or "active", in Charreau's terminology, the plow should probably be used only to help break up small roots during the field clearing and opening process. Tillage operations should then become progressively less intense, concentrating more on the requirements of different crops for timely seedbed preparation. The basic point is that the decision to include or exclude certain tillage practices in a given area should be based on good site prospection before extension activities begin. Unfortunately this has not been the case in the past, and it is unlikely to occur in the AID TAT project until the second year. Even at that point, the project is going to have to be able to demonstrate to farmers and other projects that its tillage recommendations are practical and make a noticeable difference. The CAT demonstration/testing fields will be important sites for this activity.

One of the important points usually overlooked in the debate about the interaction of tillage practices and soil water balance is that hand hoe farmers are usually not able to prepare land early enough to take advantage of increased water infiltration or detention. The soils in the project area harden over the dry season and farmers must wait until the soils are moist enough to work by hand. Furthermore, the time a farmer waits is probably influenced by the amount of family or hired labor available. Farmers who have little labor will have to work longer to cover the same surface area. The tendency will be to hoe and plant the surface area that can be covered over a few day period. It may take several planting rainfalls and cycles of soil wetting and drying before a small family can plant their full complement of early crops. Also, hoe farming's major labor constraint is weeding, which can be exacerbated by staggered land preparation phenomenon described above. Thus, a farmer may, and frequently does, delay land preparation until the soil is very moist and easy to work. Of course, by this time weed growth is usually abundant, which may require the use of the plow to turn under the weedy vegetation. Where labor for weeding is an important constraint, tillage may be delayed in order to reduce

the number of weedings required in a season. This usually has a significant negative effect on yields. However, in environments where rainfall variability is high, early tillage followed by several weedings usually translates into lower surface area cultivated and therefore greater vulnerability of total production to seasonal dry-spells.

Weeding

It should be apparent from the above discussion that the weeding operations are critical to the successful use of animal traction. This point has been made by many workers in the field (Sargent et al, 1981; Barrett et al, 1980). Without the effective adaption of weeding implements by farmers to their cropping systems there is little hope for substantial yield or surface area increases.

Farmers in Togo use some of the tillage equipment as weeding tools. The plow and ridger are essentially being used as weeding tools when planting dates are delayed. They serve to remove the standing weeds and to reduce the amount of hand weeding that will be required later. In the area of the GTZ project, south of the proposed project zone, farmers are plowing early but delay planting until most weeds have germinated. Then they use the spike tooth harrow to knock the young weeds down and prepare the seedbed.

It seems clear that farmers have not yet seen the yield advantages which accrue to early planting because they have not been able to overcome the weed challenge that occurs once the crop has been planted. Very few farmers have been reported to use either the weeding triangle or the peanut lifters as between-row weeders. While standard objections about the incompatibility of the weeding implements with the various intercropping practices were raised by many extension and production personnel, there are already sufficient areas of row planted crops, where intercrops would not interfere with weeding, that one has to look for other explanations. One of the key problems seems to be that the extension agents and animal trainers have not been trained in the use of weeding equipment. While at least one weeding demonstration has been done at Agbassa, none of the extension personnel encountered felt confident enough to undertake the introduction of the technology to farmers. The development of extension agent skills in the use of weeding implements has to become the priority training and demonstration element after the basics of animal handling are mastered.

Even with increased attention to the training needs of extension agents and animal trainers in the use of weeding tools, there remain some technical problems to be resolved. For crops grown on ridges the existing ridger cannot carry out weeding of the sides of the ridges. As has been done in other countries, the ridger wings can be cut and angle blades attached to clean the ridge slopes. Another problem is that the weeding triangle and peanut lifters do not permit between-plant cultivation, which is important for the wide spacings employed with some of the cereal crops. While some modification of the spacing may be required, planting

on the square would enable the weeding tools to completely cover the field by cultivating in two directions. In wetter areas where denser stands may be planted, the goal should be timely establishment of the crop and early weed control to permit early achievement of a closed canopy to suppress weed growth within and between the rows. However, this option may only be advisable on soils of sufficient fertility to maintain the higher plant populations.

As in the case of initial land preparation, one must expect that the animal traction package for various cultural operations is not going to be so much a single set of implements and practices, but a series of sets of tools and practices selected on the basis of site needs and current farming practices.

Ridging

Crops are grown on ridges and on the flat in the project zone. Farmers had many explanations for their ridging and tie ridging practices which relate to water conservation, drainage, and ease of harvesting of certain crops, such as peanuts and Bambara groundnut. One of the major observable effects of ridging as now practiced is that it reduces the labor requirements for land preparation. Using the hoe, farmers slice about 8 cm deep into the soil and then turn the soil and vegetation over. Arriving at the end of a row, the operation is repeated in the opposite direction, creating a small ridge which encloses the standing weed biomass. It is very likely that this process, while perhaps aiding surface drainage in some cases and facilitating late harvest of peanuts, restricts root development. Also, available nitrogen might be tied up in the process of bacterial decomposition of the weed mass at the same time that young plants are beginning to make demands on soil nitrogen.

Use of the ridger should enable better initial soil preparation and mixing of the plant material and previous year's crop trash within the ridge. In the drier areas of the project zone, the larger ridges produced would be more effectively tied to conserve rainfall falling early in the season. And as stated earlier, on some of the shallow soils, ridges may prove to be the best way to avoid acceleration of erosion processes.

Harvest Aids and Postharvest Uses for Equipment

One of the components of the available animal traction equipment is a set of peanut lifter blades. While they can be used to lift peanuts, the late harvest of the crop in the project zones may require a heavier implement. When peanuts are planted on ridges it has been reported that the plow has been used as a lifting tool.

This use, and the reported use of the peanut lifter as an interrow weeding tool in other countries in West Africa, indicates the need to retain flexibility in the way implements are extended and to encourage farmers to try nonstandard uses. One example of a potential target for such use is the pulling of cotton plants following boll harvest. While one of the recommended practices is the removal of cotton plants and their destruction to avoid pest carryover from one year to the next, few of the farmers appear to practice it. Use of the peanut lifter blades might be advocated if the cotton harvest finished before the soil hardens. The cotton parcels may provide a good opportunity to observe the effects of postharvest plowing before the dry season on the subsequent ease of land preparations and early rainy season weed growth.

General Comments on Agronomic Practices and the Animal Traction Learning Curve

The introduction of animal power and draft equipment to the farm has the potential for greatly multiplying crop management flexibility. But the animals, animal care, and the use of equipment must be mastered before the potential can be realized. Even when this mastery is developed, farmers must be convinced of the utility and profitability of employing new management skills before they will be used.

When farmers receive a pair of animals and equipment they must make major changes in their daily working patterns and habits. This fact, combined with the need to acquire and hone the abilities to handle a variety of field operations, translates into a time frame of years before farmers gain real control of the technology.

This general perspective on the evolving nature of animal traction on the farm has important implications for the programming of extension efforts. One of the reasons plowing and ridging are readily accepted is that they occur before the crop is in the ground. Farmers risk no damage to crops and are free to experiment with animal handling and variations in equipment use. Once the crop is sown and growing, fairly precise skills are needed to avoid trampling of plants by animals or destruction or damage to the stand by misguided or incorrectly set tools. It can be expected that even with intensive training and close extension follow-up, farmers will be reluctant to initiate weeding operations during the first year. While there will be some exceptions, most farmers will probably progress from plowing to ridging to weeding flat-planted crops over a two-to-three year period. Given experience in other West African animal traction projects, even this estimate may be optimistic. To turn the optimism into a realistic expectation, project staff are going to have to rethink the procedures currently practiced under the AIP for breaking and training animals and instructing extension staff

and farmers in their use.

Project management needs to understand that there are learning curves that induce time-lags all along the chain, from training centers to extension agents to project managers and trainers. The five and one-half year TAT project will probably only be able to introduce a few major innovations in field operations. Weeding with draft animals should be the central innovation if animal traction is to be established on a sustainable basis. While learning curves may only be susceptible to minor modification, the project can and must speed up the process of information flowing from the project to the farmer and back again in order to determine what modifications have to be made to integrate weeding equipment into cropping systems. To this end, the agronomist will work closely with the personnel of the monitoring and evaluation unit of PROPTA to set up micro-level farm data collection and analysis procedures. This information is aimed at existing tillage and weed control procedures, how they change with draft power introduction, and what approaches may be used to improve the chances that weeding implements will be effectively employed.

During the interim period from late 1982 to late 1983, it is expected that greater emphasis will be given to training extension staff and farmers in the use of weeding equipment. The 1982 Peace Corps volunteer training program includes more substantial work with weeding implements than has been done in the past. GOT extension staff are also aware of the need to acquire weedings skills so that they can demonstrate to farmers how to use and adjust equipment. The interim period should see the introduction of a better balance in the training given to farmers so they have greater initial exposure to the full range of equipment and its use.

Assuming that the interim period will develop the machinery-related aspects of weeding, the second and third years of the project should be devoted to observation of primary tillage-weeding practice interactions along with tests at the CAT's and with farmers in their fields. This period should enable the agronomist to make concrete extension recommendations for primary tillage and weeding practices before the fourth year of the project. Also, by this time, a few middle-level extension personnel will have been trained by the agronomist to continue monitoring of and modification to the tillage-weeding practices.

Fertility Maintenance

Current fertility maintenance practice in northern Togo is dominated by shifting cultivation, and to a lesser extent among some ethnic groups, manuring of household plots and nearby fields with composted animal wastes, garbage and sweepings. Fallow cycles vary widely and seem to be more of a function of demographic pressure than of the time required to restore fertility. For example, in one part of the Kara region (Landa Pozenda) where sandy textured soils are prevalent and population pressure high, fallow periods are said to be about two years. In an area of heavier clay soils, also in the Kara region (Helota), but with lower population density, fallow periods were reported to be four years or longer.

The manuring practices of the Kabiye are well-reported in the ethnographic literature (see references in the Social Soundness Analysis). Their net effect is to refuge nutrients on small household plots which are intensively utilized to produce the first food crops for the hungry period, and a second crop, or late maturing intercrop, to boost overall production. However, the manuring practices cannot be applied to extensive fields because of a dependence on the supply of important nutrients from crop residues, ashes, and animal wastes which have been provided by a much larger area of vegetable biomass.

Less common but important for crops such as maize, rice, and universally, cotton is the application of manufactured fertilizers. Currently, about nine fertilizers are used (15-15-15, 25-15-15 S (4.8)B(1.3) -- the cotton formulation, urea, ammonium sulfate, triple superphosphate, single superphosphate, crushed rock phosphate, sulfur, and very limited quantities of dolomitic limestone). Of these, the most widely used fertilizer is the cotton formulation which may or may not be combined with urea applications. While designed to meet the nutritional requirements for optimal cotton growth, it is also highly acidifying (68 kilogram per 100 kg lime equivalent). The second most widely used fertilizer is 15-15-15. Both formulations are recommended for application when any one of the macronutrients is in short supply, regardless of existing soil type or pH.

Most of these fertilizers are being used as part of crop production programs in Togo without much modifications. Some research organizations have been carrying out trials on the use of Togolese rock phosphate, with or without sulfur additions, as a low-cost phosphate source. IRAT and Togo's IMPHOS research group have executed trials over an eight year period. This work has demonstrated that, compared to rock phosphate, triple superphosphate does show an advantage in the first year after application; but crushed rock phosphate, partially acidulated with elemental sulfur or sulfuric acid, comes within 60 to 90% of duplicating

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triple superphosphate effects on yields in the year of application, with the added advantage of strong carryover effects after a single year's application (Bruce and Marquette, 1979, Direction de la Recherche Agronomique, undated a and b.; M'Po and Martin, 1982; Baran and Marquette, 1982). Other work in Upper Volta and Nigeria indicates that rock phosphate and sulfur can substantially boost grain and biomass yields on phosphate-limited soils (Poulin et al. 1982). While rock phosphate and sulphur should not be viewed as a panacea for soil fertility problems, they should be useful on many of the acid soils in the project zones, particularly when combined with legume cultivation. The project will develop rock phosphate application recommendations from the research information available in Togo, Nigeria and Upper Volta.

It is often hoped that animal traction will enable a close linkage to develop between crop production and livestock production through the use of manure. However, a single animal is unlikely to produce much more than a ton of manure annually. Most recommendations call for about six to ten tons of manure per hectare. A pair of animals would provide sufficient manure for about one-fifth to one-third hectare per year. For a three hectare farm, it would take nine to fifteen years to cover the cropped surface once. For a four hectare farm it would take 12 to 20 years. Therefore, it should not be expected that the use of manure or compost will have a major effect on overall farm productivity during the five year period in which the original loan has to be paid off. The agronomist will, however, work with the team agricultural economist to monitor the costs in terms of labor and materials for the collection, composting and application of composted manure at CAT's and on the holdings of animal traction farmers in order to compare returns from use on household gardens and the more extensively cultivated outer fields.

Rotations

Even when exceptionally well-planned and executed, crop rotation trials take several years to generate useful results. The project's role in crop rotation work will be confined to economic evaluation of rotational schemes recommended by the research institutions, and monitoring of rotation impacts on the productivity levels of holdings on which draft animals are used. IRAT recently published a ten-year synthesis of results which, when combined with work being done by the OAU/SAFGRAD group, can be used to prepare extension recommendations adapted to different production environments, farm cropping patterns, and past cropping history (Baran and Marquette, 1982; M'Po and Martin, 1982). Working with this information over the life of the project, the agronomist and Togolese staff may suggest modifications to current rotation

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trials to deal with the technical adjustments needed to make rotations economically attractive to project area farmers.

The project will undertake some field testing at the training center at Agbassa, on CAT's and in farmers' fields on methods to establish forage crops. The objective of these tests is to extend dry season grazing on cropped land and to improve the grazing quality of fallowed area.

There has already been some effort devoted to testing forage crops and their potential for integration with draft animal farming. However, much of this work has used forage crop species and cultivars from extremely limited sources. Togolese work with Stylosanthes humilis and Stylosanthes guyanensis is a case in point. While Australian researchers have developed many cultivars which are essentially ecotypes with different disease tolerances and growth habits, Togo researchers receive their cultivars from the Ivory Coast. The cultivars available have proven to be extremely susceptible to a race of anthracnose.

In one case where a search was made for a leguminous pasture species adapted to the climatic conditions of the area, initial results have been encouraging. The plant in question is siratro (Phaseolus atropurpureus) which has been successfully tried at the GTZ project in the Centrale region. Other potential leguminous forage crops for which research data are available include silver leaf desmodium (Desmodium uncinatum), puero (Pueroa phaseoloides), and other crop plants which can be used for forage, e.g. mung beans, lablab beans, and pigeon pea.

When the project agronomist arrives in 1983, the latest information on forage crop establishment and performance will be gathered and used to rank the species available as to ease of establishment, persistance in grazed stands, and animal preference. Then observational tests on the top two or three forage crops will be run during the 1984 and 1985 rainy seasons. One set of tests will be run on the CAT's to test undersowing procedures in cereal stands. It will consist of a restricted run of trials to determine a range of planting dates which enable the forage crop to establish itself without affecting crop yield. Similar efforts have been undertaken in Malawi and in Southeast Asia which indicate that undersowing is a feasible technology (D. Thomas and R.J.Bennett, 1978; H.M.Shelton and L.R.Humphreys, 1975). Trial design will involve the superimposition of a randomized date of undersowing on a CAT sorghum, maize, millet, or rice field. Both an annual forage crop, as a dry season forage extender, and a perennial forage crop, as a fallow establisher, will be tried.

On a few farmers' fields a very small set of parcels, designated by the farmers to be abandoned that year, will be undersown with a perennial or annual forage species. Again, the trial design will be a

superimposed date of undersowing, but with a very conservative guess-timate of the minimum delay needed between crop sowing and forage crop undersowing to maintain cereal production.

These trials will be monitored for establishment, effect on crop yield, carry-over of a stand into the next year, and persistance in the stand under farmer-managed grazing and material and labor inputs. Fallow fields being taken out of fallow for cropping will be observed to determine the methods used, and time and effort required to accomplish the job.

Agroforestry

As previously mentioned in the section on agronomic practices, a low intensity agroforestry is already being practiced on farms in Togo. The tree species involved are mainly fruit and pod-bearing trees used for food, oils, and resin providers. However, fuelwood is likely to become a localized problem in areas where land occupation rates are high, even though on a national level Togo has good wood supplies. The national forestry parastatal (ODEF - Office des Eaux et Forets) is planning a shift to village forestry activities in the second phase of a UNDP/FAO supported project. Where appropriate, the TAT project will coordinate with ODEF in demonstrating practices such as the taungya establishment method in which crops are grown under tree seedlings to maintain weed control and to generate some return to investment while the trees grow.

One special observational trial will be undertaken at one or two CAT's in the higher rainfall areas of the project. This will be the establishment of an alley cropping plot of one hectare of Leucaena leucocephala, using the latest information from IITA on management of the alley shrub as a fodder, mulch, and wood producer.

ADAPTIVE FIELD TESTING

During the PID review, the observation was made that perhaps the TAT project should be a research project with the objective to develop technical packages and an animal traction farming system which would then be extended in a later project. This section briefly discusses the reasons why the design team believed that this was not a viable alternative.

Past Research and Experience

One of the prime reasons for not designing a research project is that the animal, equipment and the crop questions have been already been the subject of much research and many development projects. West Africa has been the site of hundreds of animal traction efforts of which a smaller subset have been sufficiently well documented to be analyzed in detail (Sargent et al, 1981). The general history of the major animal traction efforts is fairly well-known (King, 1939). A recent synthesis has explored the multidisciplinary nature of the study of the draft linkage between crop and livestock production (McCown et al, 1979). A large body of research on cropping and intercropping techniques adapted to animal traction has been done and is being updated at the Samaru Research Station in Zaria, Nigeria (Andrews, 1972; Baker, 1979, a and b, 1980; Heathcote, 1969). As this station is in the same agroecological zone as much of the northern Togo, much of the research should be directly applicable. That this hypothesis is likely to be true is confirmed by some of the early results of the joint OUA/SAFGRAD project which has been testing some of the crop cultivars and practices developed at Samaru with some very encouraging results in Togo (M'Po and Martin, undated). Additionally, the AID-funded AIP and other donor projects have helped define many of the operational parameters that need to be considered in carrying out animal traction extension in Togo.

In sum, the knowledge universe about animal traction technology is large. The challenge is to evaluate and synthesize the knowledge and adapt it to local conditions in a way that is economically feasible. The design team feels that the overall direction of the project should thus be much more akin to a product development operation, than to an agricultural research project. In the context of developing animal traction product and tailoring it to fit different farm enterprises, the team feels that most research modes would be nonadaptive.

Research Approaches and Trends

The terms research and applied research are subject to a wide variety of interpretations. Generally, as more and more of the constraints which face a population of farmers is dealt with, the more applied the research becomes. At the same time, as more constraints and different kinds of constraints -- economic as well as technical, social as well as economic -- are dealt with, the degree of certainty decreases with which a controlled experiment removed from the "real work" environment of resources and constraints can specify a solution to a problem. This is particularly the case as the degree of farmer control over experiments increases.

A recent review of AID-assisted agricultural research projects notes the following range of interpretations of what forms on-farm research can take:

- Researchers can experiment on plot located in farmers' fields. This approach basically tests a technology's response to a wider variety of agro-climatic conditions, but does not involve the farmers nor test their ability to manage the technology;

- Experimental plots can be located on farmers' fields with researchers prescribing some practices (those they want to test), while farmers do the remaining work themselves in largely traditional ways, or;

- The farmer can totally manage the plot, allocating the resources and doing the work he chooses. Researchers then evaluate the technology's performance under these conditions. (Crawford and Barclay, 1982, p.15).

The TAT project will deal predominantly with the last step in this progression. It is intended to do adaptive field testing in animal traction which would be under the control of farmers. TAT would take, for example, the best available practices from the OUA/SAFGRAD pre-extension trials and present them as extension themes to be tested by farmers. It would not undertake significant technology generating work of its own.

TAT Adaptive Field Testing

The basic approach to be used in adaptive field testing centers is to take small phased steps towards improvement of practices which have a low risk factor for adoption. For example, due to certain soils, there may be the need to move from moldboard plowing to reduced tillage pro-

cedures. One of the steps would have to be the modification of the ridger wings to enable the tool to weed the sides of the ridges. The basic tool exists, as does the knowledge of how to modify it. What is required is the testing and adaption of its use on farmers' fields. Another example would be dry season fodder conservation. The technologies are known, but how to economically manage the techniques on the farm is not. An applied research program on a station, or controlled by researchers on a farm, would not give reliable management feedback for adaptive purposes.

For on-farm adaptive field testing to work, the monitoring and evaluation system must be organized to collect reliable economic data, analyze it, and present the results of the analysis in an interpretable form. The agronomist will have to work with all team members to ensure that the right data points and data collection methods are employed.

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ANNEX FOUR SOCIAL SOUNDNESS ANALYSIS

INTRODUCTION

ON ETHNIES IN THE PROJECT ZONE

Who lives where?
How are they organized?
On our knowledge of social organization in northern Togo
How do they farm?
On communication strategies: the use of ethnoscience

ON THE EFFECTS OF ANIMAL TRACTION ON LABOR ALLOCATION

ON MOTIVATION AND THE NATURE OF PROJECT BENEFITS

ON MINIMUM PARTICIPANT PROFILES

ON TRADITIONAL LAND TENURE SYSTEMS AND ON RECENT LAND REFORM LEGISLATION.

CONCLUSIONS

ANNEX FOUR

SOCIAL SOUNDNESS ANALYSIS

INTRODUCTION

Togo Animal Traction will include interventions on the national level and at the regional level. On the national level the project will strengthen the PROPTA (Projet de Promotion de la Traction Animale) in its role of coordinating procurement and distribution of draft animals and equipment in Togo, will establish a monitoring and evaluation unit to set up comparable measures of the effects of the traction equipment, and will strengthen training capabilities. On the regional level, the project will strengthen the DRDR's capacity to coordinate the supply of draft animals, equipment and medium term credit to smallholder farmers in the Kara and Savanes regions, and will improve the support services available to farmer-adopters. Specific field interventions of the TAT will be concentrated in the two northern regions. A series of revolving funds will be set up to fina e procurement of draft animals, equipment and and some support services for those parts of Kara and Savanes regions that are not served by other projects. It includes a program of short and long-term technical assitance to PROPTA, primarily in the north, and the development of short-term training programs to be administered by many cooperating animal traction projects. Intervention in the Kara and Savanes regions will include training for field level DRDR personnel and field agents of other projects in the region, technical assistance to improve local level coordination in animal traction activities and to modify and adapt equipment recommendations, and to improve agronomic and animal feeding recommendations. Eight Peace Corps Volunteers will serve in the northern regions as a technical an logistical resource for agricultural extension district-level workers and establish several small-scale storage-and-service points (CAT's) for distributing inputs.

Figure 1 shows the location of the Kara and Savanes regions.[1] Within these areas, AID-funded extension activities will cover zones not served by other agricultural extension projects. Figure 2 shows all current animal traction project zones in the prefectures of Keran, Doufelgou, Kozah, and Binah - all in the Kara region. Figure 3 shows approximate locations of other major rural development projects in northern Togo.

The major benefits of the project will come from increases in labor productivity as farmers master animal traction techniques. Elsewhere in West Africa, projects promoting animal traction have found that farmer-adopters are able to increase cultivated area 10 to 30 percent and to increase yields 15 to 40 percent, depending on the crops (Sargent et al., 1981). If marketing facilities are adequate and

[1] Recently expanded to include the prefectures of Bassar and Assoli.

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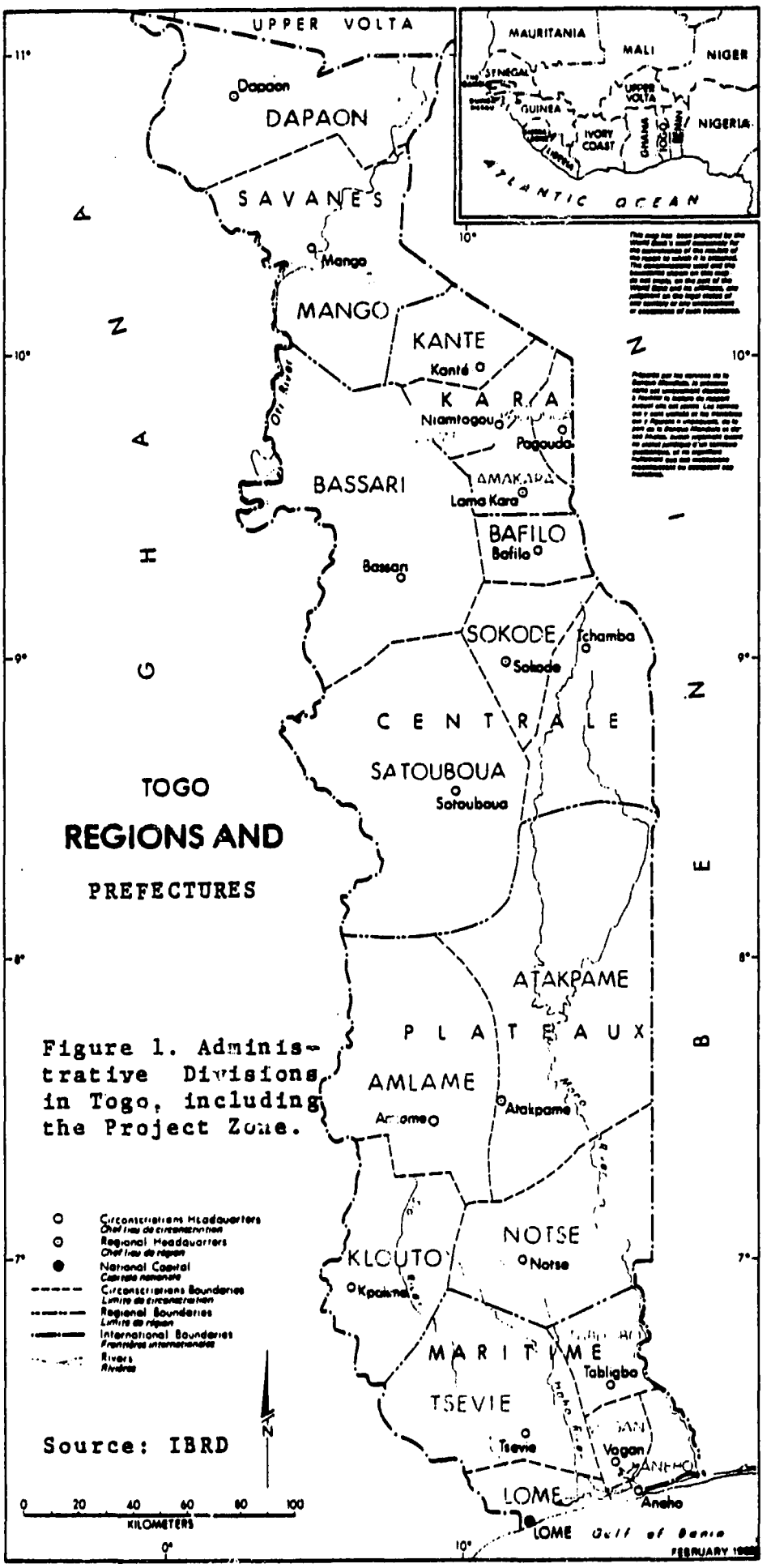

Figure 1. Administrative Divisions in Togo, including the Project Zone.

Source: IBRD

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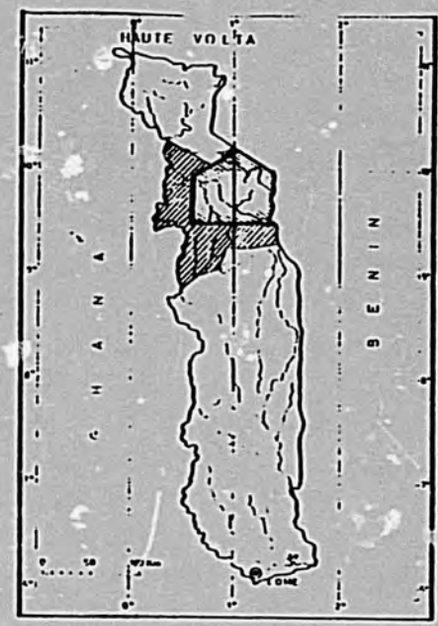
REGION DE LA KARA

Figure 2. Kara Region. Location of Projects



PLAN D'ENSEMBLE

Situation de la Région de la Kara

Limite de la Préfecture Administrative

Limite d'Etat

Routes

Cours d'eau

▲ BLOCS ORPV

1. Atteda
2. Bounon
3. Dongoyn
4. Kagnigada
5. Siou Kawa
6. Baga
7. Siou
8. Atetou
9. Atakote
10. Kéran
11. Karawal

▲ Blocs en création

12. Sola
13. Matema

Δ Blocs en prévision

14. Sara-Kawa
15. Nandoudja

A. Projet TOGO NORD PNUD/FAO

B. Projet Vivrier Atchangbadé Sirka USAID/FE

C. Projet F.E.D Vallée de la Kara

D. Projet BINAH SUD

E. Réserve de la Faune

F. Zone à reboiser

G. Zone de Projet: AID BENIN

Résidence Encadreurs DRDR

Résidence Moniteurs DRDR

Résidence Adjt Technique DRDR

Encadrement DRDR

(à) Centre Formation Agricole d'Atteda

REPUBLIQUE POPULAIRE DU BENIN

REGION DES SAVANES

KANTE

NIAMTOUGOU

LAMA-KARA

PAGC

UDA

KARA

A. Projet Nord-Togo

B. Projet Vivrier

C. Animal Transit Site

C1. AID Animal Breeding, Training and Supply Center

C2. FED Vallée de la Kara

D. Projet Binah Sud

E. Réserve de la Faune

F. Zone à Reboiser

G. Projet Togo-Nord

Figure 3. Savanes Region: Other Projects

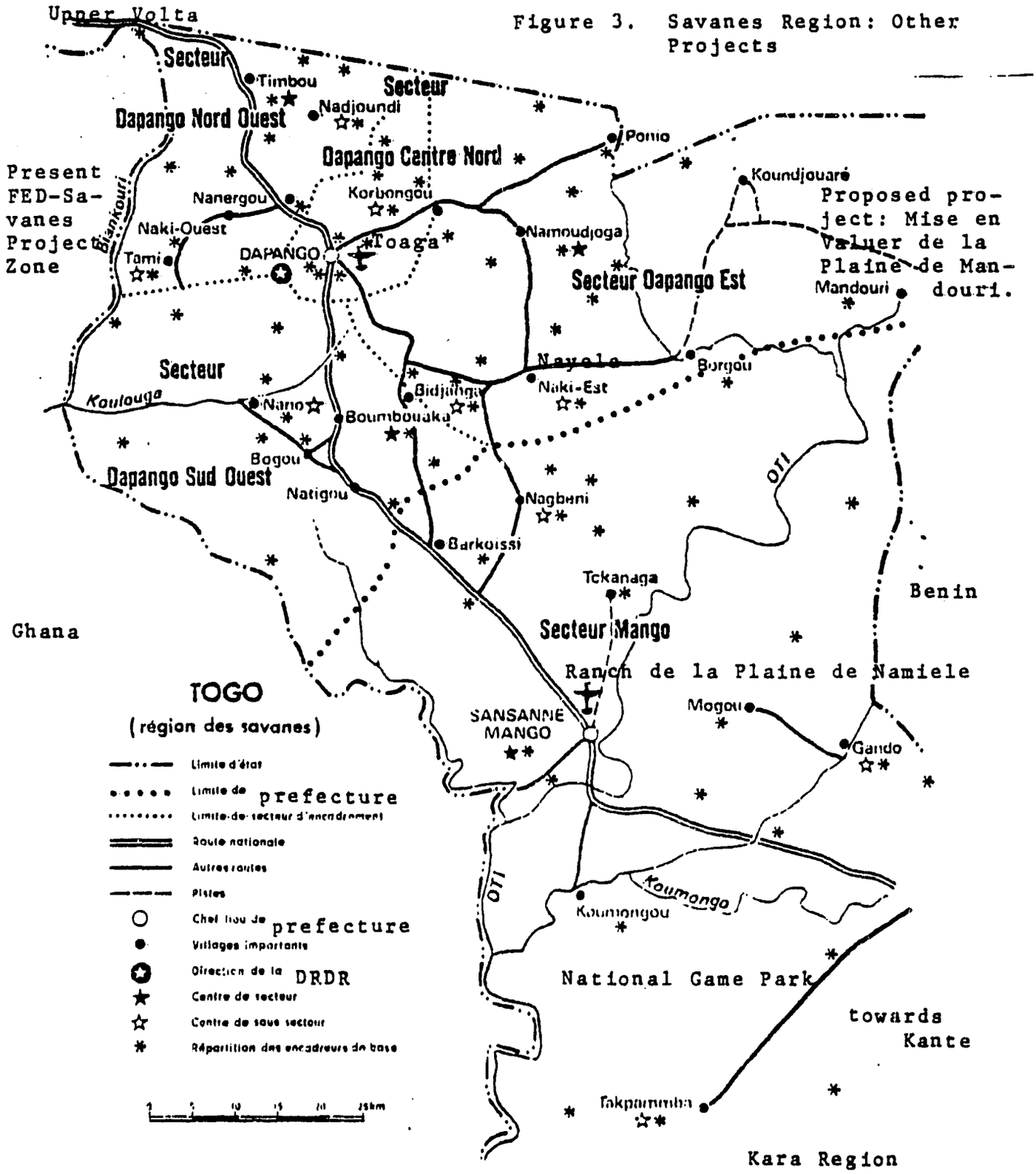


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Table 1:

Resident Population of Project Zone, 1960-1980 by Circumscription/Prefecture

1970 Circumscriptions[1]	1960 population	1970 population	% change 1960-70	1980 Prefectures[2]	1981 population	% change 1970-81
Kara						
Kande	31,893	41,431	29.9	Keran	44,762	8.0
Lama Kara	87,543	99,.215	13.3	Kozah	120,878	21.8
Niamtougou	43,369	52,070	16.7	Doufelgou	66,120	27.0
Pagouda	38,359	44,588	16.2	Binah	50,077	12.3
Bassar	72,953	95,475	30.9	Bassar	118,345	23.9
Bafilo	21,147	29,445	39.2	Assoli	32,444	10.2
	295,264	362,224	22.7		432,626	19.4
Savanes						
Dapaong	140,466	183,164	30.4	Tone	249,079	36.0
Mango	47,023	57,559	22.4	Oti	77,747	35.1
	187,489	240,723	28.4		326,826	35.8

Sources: [1] K. Zachariah and N.K. Nair, Togo: External and Internal Migration in Demographic Aspects of Migration: Volume 2: World Bank Working Paper.

[2] Togo. Direction de la Statistique. Resultats Provisoires du Recensement General de la Population et de l'Habitat (9-22 novembre 1981): Comparison avec Recensement General de la Population 1970 (1-30 avril).

Table 2: Population Density 1970 and 1980

Circumscription	Area[1] (km2)	1970[3] density	1980 density	Prefecture
Kara				
Kara	1075	92.3	112.44	Kozah
Pagouda	480	92.9	104.3	Binah
Niamtougou	1275	40.8	51.8	Doufelgou
Kande	1660	24.9	27.0	Keran
Bassari	6100[2]	15.65	19.4	Bassar
Bafilo	-	-	-	
Savanes				
Dapaong	4570	40.1	54.5	Tone
Mango	3900	14.7	19.9	Oti

1 J.Mirival, N. Agbegninou, 1974

2 SOTED/BCEOM/BDPA, 1981

3 Table 1.

and producer prices are remunerative, animal traction should be able to contribute towards increasing farm employment and to raising rural household income. Over the long-term it is possible that animal traction will allow farmers to adopt something of a field rotation pattern using green manure crops, and that resulting improvements in soil structure and fertility will allow more intensive cultivation of the soil, reduce fallow periods,and slow the rate at which wooded land is cleared for cultivation.

Experience in animal traction projects (Sargent et al., 1981 and Barrett et al., 1981) has shown that realizing the potential benefits depends on the interaction of many factors. Much of the short-term increase in farm production comes from expansion in cultivated areas rather than increases in yields, and so uncultivated land must be available and the system of land tenure must be able to reallocate land to adopter farmers. Farmers generally master land preparation

techniques with animal traction before they are able to use the weeding equipment skillfully. Since some sorts of weeding cannot yet be done with present equipment and practices, the availability of labor at certain points in the year becomes crucial. Because the equipment is expensive, and because it takes several years to learn to use it effectively, net income usually drops in the first years after adoption and adopter households often need supplemental income from non-farm activities to meet increased cash expenses, including the annual payment for the animal traction loan.

This analysis will first discuss the populations in the project zone, their social organization, and their present farming systems. A discussion of the probable effects of animal traction on the allocation of land and labor follows. Finally, this analysis will approach some issues that could potentially affect motivation to participate in the project.

ON ETHNIES IN THE PROJECT ZONE

A. Who lives where?

Table 1 shows the population of the project zone from 1960 to 1980, broken down by region and prefecture. The average yearly rate of population increase in the Kara region as a whole fell from 2.3 percent per year (for the period of 1960-70) to roughly 1.8 percent per year (for the period 1970-81). During the same period the average rate of population growth in the Savanes region increased from 2.8 percent per year to about 3.2 percent per year. Some of the variation in the average yearly population growth can probably be explained by overall population density (shown in Table 2) and growth in urban population. Niamtougou and Lama Kara both grew extremely fast between 1970 and 1980; among other prefectures of the Kara region, those grew slowly that had relatively high population density. In the Savanes region, however, both Tone and Oti grew at roughly the same rapid rate in spite of lower overall population density in Oti. These rough figures for the Savanes region do not take into consideration the areas included in game reserves and therefore closed to settlement.

Table 3 gives a very rough idea of the distribution of population in each prefecture (except for Assoli) by ethnic group, as of about 1972, and Figure 4 gives the geographic distribution of ethnic groups in northern Togo as of about 1960. There is a bewildering number of linguistic and ethnic groups in the project zone, and the easiest way to approach the diversity is to follow the standard ethnography on the area (Froelich, Alexandre and Cornevin, 1963), to group most of them roughly into three major groups, as in Figure 4, and then to discuss the groups with the strongest affinities outside Togo.

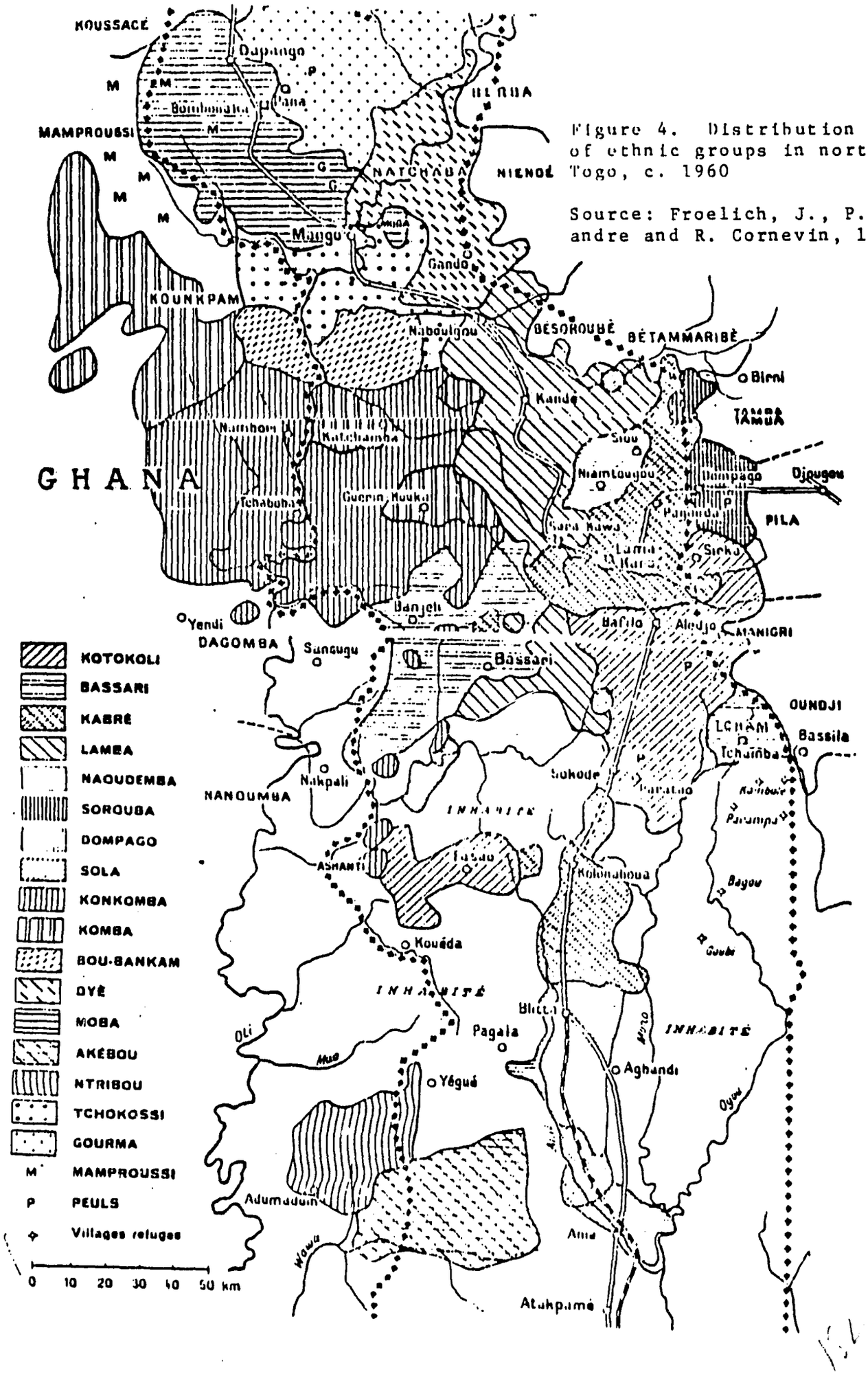

Figure 4. Distribution of ethnic groups in northern Togo, c. 1960

Source: Froelich, J., P. Alexandre and R. Cornevin, 1963.

The southernmost group in Figure 4 comprises the Kotokoli (located mostly in Bafilo) and the Bassari. Although the two group speak languages with different origins, there are similarities in economic and social organization and both include a growing number of Muslims. The Kotokoli speak a language in the Tem group, trace traditional political allegiance to the village of Tabalo (founded by a Gourma incursion during the 17th century) and traditionally lived under a paramount chief at Tchaoudjo. The Bassari (who call themselves Be-Tyambe, or smiths) speak a language related to Konkomba, and have extremely heterogeneous origins (Froelich, Alexandre and Cornevin, 1963, pp. 5-16).

North of the Bassari and Kotokoli on Figure 4, the group comprising the Kabiye, the Lamba and the Naoudemba is the major group affected by the AID Accelerated Impact Project that preceded this project. These populations occupy most of the former La Kara Region. The Kabiye, like the Kotokoli, speak a Tem language but never formed a single political system. Kabiye speakers form three major groups of dialects. In the northern plateau are Lama, including the villages of Lama-Tessi, Pouda, Boufale, Sioukawa and Sarakawa. The southern plateau has the Kabiyemba dialects, including residents of Kodgene, Piya, Tchichao, Lama, Lassa, Tchare and Kara. Finally, the Logba dialects cover areas to the east, including Koumerida, Wakede, Boumdo, Ketao and Djougou (in Benin). The Lamba (also called the Losso) can be similarly divided into several groups of dialects. Both the Kabiye and many of the Lamba claim to be autochthonous (some Lamba claim to come from around Defale, slightly north of Niamtougou). The Naoudemba (also called the Losso Birinawa or Losso-nyima), in contrast, say they migrated from Upper Volta in the 17th century to occupy the area around Siou, Niamtougou, Baga, and Tenega, driving the Lamba toward the south and east (Froelich, Alexandre and Cornevin, 1963. pp.63-70).

The northernmost major ethnic conglomeration on Figure 4 includes the Moba, the Dye, and the Konkomba, all of whom are spread out along the plain of the Oti River Ethnographic information on the Dye and on the Moba is very sparse. e know little about them until they became vassals of the Mamproussi (to the west) and of the Gourma (to the north in Upper Volta) during the 17th century (Tourne, Djangbediaand Affognon, 1974. p.19). There was considerable linguistic borrowing from both groups. The Dye (or Ngam-ngam, which is what the Tchokossi called non-Muslims) claim to be autochthonous, and were driven to the south and east by the Tchokossi in the mid-eighteenth century. The Konkomba[1] (who call themselves Kpamkpam) are better known than the more northern groups, (Froelich, 1954) and form a relatively more coherent whole. The origins of Konkomba clans are diverse: some claim to be autochthonous, others have to come from the Gourma regions in the north, during the 18th century.

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[1]Including the Komba around Guerin Kouka.

Table : :

APPROXIMATE DISTRIBUTION OF POPULATION BY ETHNIC GROUP circa 1972 (percent)

Regions:	Savanes[1]		Kara[2]					Total
Prefectures:	Tone	Oti	Kozah	Binah	Doufelgou	Keran	Bassar[3]	Project Zone[4]
Ethnic Groups	(Dapaong)	(Mango)	(Lama Kara)	(Pagouda)	(Niamtougou)	(Kande)	(Bassar)	
Moba	40	15	-	-	-	-	-	14
Peul	5	2	1	1	1	1	-	2
Gourma	45	-	-	-	-	-	-	14
Mossi	3	-	-	-	-	-	-	1
Yenge	2	-	-	-	-	-	-	1
Tchokossi	-	38	-	-	-	-	-	4
Kabiye	-	2	96	84	0	0	10	25
Konkomba	-	2	-	-	-	-	26	4
Lamba	-	2	0	0	32	81	10	11
Boussansi	1	-	-	-	-	-	-	0.3
Ngam Ngam	-	28	-	-	-	-	-	3
Losso	-	-	3	0	27	0	10	5
Naoudemba	-	-	0	0	34	0	-	3
Tamberma	-	-	0	4	6	15	-	2
Solo	-	-	-	11	0	3	-	1
Bassari	-	-	-	-	-	-	30	5
Misc.	4	11	-	-	-	-	-	5
	100	100	100	100	100	100	100	100

Sources: [1] SEDES Monographie de la Region des Savanes (Version Provisoire), 1972.

[2] SEDES Monographie de la Region de La Kara (Version Provisoire), 1972.

[3] SOTED/BCEOM/BDPA Projet de Developpement Rural Integre des Regions de Bassar et de Mo, 1981.

[4] Information was not available on Bafilo prefecture.

Finally, the project target zone contains three ethnic groups whose strongest affinities are to groups outside Togo: the Gourma, the Tchokossi or Anoufom, and the Peul. The major Gourma chiefdoms are in eastern Upper Volta, and the first incursions southward seem to have been set off by famines in the 17th century (Froelich, Alexandre and Cornevin, 1963, pp.125, 182-186). The earliest invadors of northern Togo, the Natchaba or Natchakou, settled around Borgou, Tchanaga, and Mogou and assimilated themselves over time to the Dye, although they continued to carry Gourma scarifications. The second set of invadors, cavalry soldiers, armed with lances, were from Fada n'Gourma. They founded principalities of Moba vassals. Some of those who settled at Bourgou late in the 19th century were Muslim.

The Tchokossi are descendents of a mercenary force that left the Ano region in Ivory Coast in the mid-eighteenth century to aid the ruler of Gonja (in northeastern Ghana) to put down a revolt (Norris and Heine n.d.). The force included both non-Muslims foot-soldiers speaking a dialect of Agni-Baoule, and warriors and councilors speaking a Mande dialect (Froelich, Alexandre and Cornevin; 1963; pp 176-182). (Islamic scholars served in such mercenary forces as purveyors of talismans and war magic.) After suppressing the rebellion, the force was asked by the ruler of Mamprussi to raid the Gourma principality of Nakitindi (just northwest of Dapaon), but the Mamprussi ruler failed to pay the troops, who slew him and spent several years ravaging northern Togo. They eventually founded a permanent war camp on the Oti (in the trade route linking the former Gonga state with the Hausa region of northern Nigeria) which is now Sansanne-Mango (or literally, Fort Mango).

In general, the Peul who came into northern Togo from the Mossi areas of Upper Volta during the first half of the 19th century are called Peul Similsi (Peul from the Mossi regions); non-Peul speakers distinguish them from Peul who entered northern Togo more recently from Upper Volta. None of these Peuls are nomadic (that is, completely without a fixed abode); all do some farming during the rainy season and most households send some cattle with some household members away from the home farm for part of the year. It is best to call them semi-sedentary (Reisman,1980). For the most part, groups of Peul have obtained permission to settle in different districts from local traditional authorities, and seem to identify themselves by the clan in whose lands they have settled. Thus, one man in Nayega (Naki-est) identified himself as Sankarba "of the same descent as the Moba", and, indeed, there is a Sakarb clan of Moba reported for the region of Namoudjoga, just to the north (Froelich, Alexandre and Cornevin, 1963. p.120). Similarly, around Dapaon, Peul are identified as Dyob, which is the name of a Moba clan in the canton of Biankouri. We will examine the economic relationship between the semi-sedentary Peul and farmers around them in later sections.

B. How are they organized?

There are several levels of social organization that are important in the planning of an agricultural project. The structure of the household is one that greatly affects the labor available to the production unit. The current pattern of mutual aid and traditional means of drawing on labor outside the household (such means may or may not be reciprocal), are also very important to agricultural activities. Knowing a little about traditional community structure can be important because, in some cases, a household's position within the community will have a major influence on its access to land.

In a project that includes agricultural extension, and short and medium-term credit for agricultural inputs, project planners are often eager to promote pre-cooperative groupings that will facilitate the taking of requests and delivery of agricultural inputs. Pre-cooperative structures will bring together a number of farmers for demonstrations of new agricultural or livestock techniques, and (most important) they will review the credit-worthiness of their members, put informal pressure on delinquent debtors, and often, guarantee payment if a member defaults on a loan. There is often an attempt to base pre-cooperatives on traditional social groups: for example, the Project North-Togo (UNDP/FAO) has advocated pre-cooperatives based on traditional mutual-aid groups found among the Kabiye, which are assumed to coincide with lineages. This section examines the relationship among residential quartiers, kin groupings, and traditional mutual-aid among the Kabiye. This section also questions whether analogous entities exist among other ethnic groups in the project area, and, finally whether pre-cooperatives have worked well in similar projects, and whether this project should attempt to promote them. Studies of household production in West Africa often show a relationship between household size and household income. Other things being equal, the largest households in a community are often the better off (e.g. Hill, 1977) and better-off households often have relatively more adult workers then other households (Chayanov, 1966). Access to the most fertile agricultural lands can also vary with household wealth (Netting, Cleveland and Stier, 1980). When animal traction is introduced into a region, it is common to find that the earliest households to adopt it are also the largest households and the households with the greatest cultivated area (e.g. Barrett et al., 1981. p.13), and the casual relationships among the variables are not always clear. Sorting out these relationships will be necessary in order to come to an accurate evaluation of the productivity effects of animal traction. In project design, it is also necessary to approach the question of how these variables are related in order to discuss the probable effects of donor interventions on income distribution.

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1. Kotokoli and Bassari

Both the Kotokoli and the Bassari traditionally formed federations of small chiefdoms which did not correspond to the administrative divisions established under the French. Both societies are formed of numbers of clans, some claiming to have originated in their present locations, other claiming to have originated outside the present chiefdoms, and others that are conglomerations of families from many areas. In both societies, the clans whose members have the right to succeed to chiefship claim descent from external conquerers. Although, in many West African societies, the Chief of the Land is chosen from an autochthonous clan, the Kotokoli Land Chief is from a ruling clan. He delegates his power to the paramount chief, who has responsibility for adjudicating land-tenure disputes between chiefdoms (Froelich, Alexandre and Cornevin, 1963. pp. 33-38).

In practice, most decisions regarding land tenure are delegated to the village chiefs, who can assign unused land to those in the village wanting to cultivate it, authorize persons from outside the village to cultivate land, and grant grazing and passage rights to Peul wanting to establish themselves in the area. Trees planted on a piece of land are considered to belong in perpetuity to the planter and his descendents, but the right to cultivate the land itself can lapse if the land is left fallow. In the mountain parts of the Kotokoli area, the rights to use rivers and the trees bordering them are assigned to specific families.

An extended family, or nyale, inhabits a single compound, and its head is generally the oldest male member of the most senior generation. In principle, the head of the household has the right to the labor of all males in the household on his fields and the responsibility to distribute grain from his granaries to his wives to feed all members of the household. Wives are responsible for providing sauce ingredients from their own gardens or from the proceeds of commerce or non-agricultural work. Other males in the household have individual fields, and dispose themselves of the production of those fields. In principle, men clear and prepare land and weed, and women sow and harvest (Froelich, Alexandre and Cornevin, 1963. p.19). However, we will see that the division of agricultural work by sex has changed over time in many ethnic groups, and it would be useful to have more up-to-date information.

2. Kabiye, Lamba, and Naoudemba

Little or no information is available on Lamba or Naoudemba social structure. A study carried out in the Landa-Pozanda, Boufale, and Atalote zones as part of the preparation for the UNDP/FAO Project North-Togo

(Othily, Sossah and Kenkou, 1974) gives us little supplementary information on the Lamba in those areas, and particularly underlines the difficulties of the households who were displaced by the creation of the Keran game reserve, in finding land in which to relocate. The social organization of the Kabiye is extremely egalitarian: that is, sex and age are the major determinants of an individual's rights and duties. The traditional political system was acephalous, that is, it has no single recognized head. The basic traditional unit was the village (or tetu), composed of several quarters (hada or hara) each consisting of 5 to 20 households (or dea), dispersed over a single neighborhood.

According to Sauvaget (1969. p.7), however, the basic political unit (tetu) corresponds more or less to the contemporary canton, rather than to the village, and the village corresponds to the clan, or edjade. In this scheme, the quarter, or hara, corresponds to an intermediate lineage segment, and there is also a minor lineage segment, or djedjeyure, which may have lands in several parts of a quartier. Loose alliances of villages were the largest polital units: the French made these alliances the basis of administrative cantons. Outside these alliances, most villages were at war with most other villages. The assemblage of household heads (soso) recognized one of their number as pre-eminent at the level of the quartier, and heads of more important households recognized a head of the village, but the authority of these leaders was extremely limited. Men became influential by being rich and by being generous with food and drink, and by grouping around themselves as many allies as possible. Decisions were generally made by concensus and the system greatly limited the power that any single individual wielded. (Froelich et al., 1963. pp. 89-105.)

The control of the head of the household over the land and labor of the household was also very limited. Most households include only a single nuclear family. There is no single set of fields belonging to the households as a whole. Rather, each adult male in the household owns a set of fields which he cultivates with his children. In principle, at the time Froelich et al. wrote, women worked only in the small gardens they were lent by their husbands. However, Kabiye in the Pagouda area who were contacted by the design team anthropologist said that there and in Tchichao, men do land preparation and make ridges and yam mounds, while women do sowing. Men do weeding and the ridging of the sorghum, and both women and men participate in the harvest, the men cutting the sorghum, and the women transporting it to the house. In Naoudemba and Lamba areas, both women and men participate in weeding and ridging, and women who have no men in the household do most sorts of agricultural work themselves, except for making yam mounds. Women cultivating a considerable area themselves often make beer and invite groups of men to do land preparation for them. Sauvaget (1969.p.11) and most of the people encountered discussed two kinds of mutual aid: a permanent grouping of young people (ekpaye or engbare in Kabiye) who work successively in each member's fields, and temporary gathering of invited workers (hara in Kabiye,

kwabe in Lamba)in which the benficiary gives beer and sometimes food for the workers.

In households in and around Agbassa that have adopted animal traction, the division of agricultural labor has changed considerably. Colonist families from Pya and from Baga reported that wives had helped with weeding before they resettled, and continue to help now (they were among the rare families met who weeded with the ox-drawn equipment). Of five women in the area who had used the oxen for at least some weeding, one reported that her agricultural workload was heavier than before. Most other women reported that traditionally they worked five days a week in their husbands' fields, and spent two days a week in their own artisinal work and commerce, and that they had continued to divide their time the same way after adopting the traction equipment. The wife who reported that her work had increased said that formerly her husband was a member of a permanent work group (ekpaye), but that since buying the oxen and equipment he had left the group and so drew more heavily on family labor.

As we will see below, many farms in the Kara area are small, and the PCV's in the Animal Traction AIP helped form several groups of farmers to purchase and manage one or more ox teams and equipment. (One incentive for forming such groups is that the official interest rates for agricultural credit are 2 percent less for groups than for individuals.) PCVs were generally optimistic about the potential for such groups, but most of the groups they discussed in any detail had had problems--such as deaths of animals or inability to make payments on the animals. The ORSTOM study for Project North-Togo found that efforts to farm commercial plots were seldom successful (Othily et al., 1974. p.42). The technical advisor for the AIP feels that in general, group ownership of animals has worked less well than individual ownership.

3. The Konkomba, the Moba, and the Dye

The Konkomba are another group whose traditional political system was acephalous. There were no traditional leaders above the level of the parish or quartier. Nonetheless, members see themselves as a single ethnic group sharing a single language. There are five major divisions, distinguishable by dialect, facial scars, and origin: the Bi-Gbimb and the Bi-Nafieb[1], and the Bi-Tchabob, the Bi-Mankimb, and the Bi-Koum (or komba, in Dagomba). Each division comprises five to fifteen clans, each claiming descent from a single ancestor, each distinguished by a name, a territory and earth-altar, a set of food taboos, and rules of exogamy. Traditionally, the clan was the largest law-enforcing unit: most clans were sporadically at war with most other clans,

[1] Both of whom were vassals of the Dagomba state, located in Ghana about 60 km west of Bassar.

except where clans had formed a formal alliance (Froelich, 1953.pp. 104-121; Froelich et al., 1963. pp 142-148).

Groups of extended-family households (or ledetchal) centered on an earth chief (outindan) constitute a quartier or parish (called itingban or ketink). Such parishes have rarely included more than about 15 household heads, but most community decisions were the result of concensus among the assemblage of household heads. The French grouped the parishes artificially into villages and appointed village chiefs; however, such chiefs had little effective authority except where they also held traditional posts, or where the colonial administration was able to lend them influence.

Each clan was composed of one or more lineages (groups of people related through males): some unitary, meaning that all members claimed the same origin, while others were composite, meaning that they were the result of combining autochthonous groups with invading groups. Composite lineages very often divided ritual responsibility among themselves: one would be master of the earth, the other would represent the oldest inhabitants. The lineages comprising a clan were more or less sub-divided, and parishes were usually chiefly composed of households in a single lineage.

The traditional organization of household production was much more collectively oriented than with the Kabiye, and the traditional household was much larger. Most sons remain in their fathers' households until they had themselves father several children.[1] The head of the household manages a large set of household fields, and the married and unmarried workers of the household together work first the fields of the household head, then (by order of seniority) the fields of other married men in the household; single men have no individual fields (although they do own smallstock). Women sow small plots in the fields of their husbands, and do not traditionally own smallstock (Froelich, 1953. p.53).

At the harvest, each married man stores the production of his fields in his own granaries, and distributes staple crops each day (for yams) or each few days (for sorghum) to his wives. Wives have the responsibility for providing the condiments for sauce.

Traditionally, men clear and prepare land, plant yams, weed all fields, and harvest yams, while women transport yam planting material to the fileds, sow sorghum, millet, manioc, and peanuts, and harvest these products. However, women also now weed; it is no longer true that "la femme ne touche jamais la houe, c'est l'outil masculin par l'excellence" (Froelich et al., 1963. p. 127).

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[1] Old women were traditionally relegated to huts well outside the compound. They complained continually from hunger, and were suspected of being witches (Froelich,1953. p.136).

Traditionally, Konkomba men keep cattle on the farm, staking them out and sending out small boys to herd them during the rainy season, and letting them roam free during the dry season. Unlike other farmers in the region, Konkomba did not traditionally entrust their cattle to the Peul (Froelich et al., 1963, p.129), and indeed were said not to allow Peul to settle in the area. However, increases in school attendance have meant that young boys are less often available to care for the cattle, and Konkomba have long invited Peul into the area and entrusted their stock to them.

Ethnographic information on the social organization of the Moba and the Dya, (or Ngam-ngam) is extremely scare and the only available information on the division of agricultural labor within the household comes from the interviews of the design team anthropologist. Tchokossi farmers say that Ngam-ngam women participates in all phases of agricultural work (in contrast to their own wives, who do not prepare land, sow yams, or weed). Moba households at Nyerga and near Barkoassi reported more or less the same division of work as for the Konkomba: men and sometimes women clear and burn land and prepare ridges and mounds for yams; women sow most crops (although men can sow them if no women are available), but only men sow yams; both men and women weed fields and ridge the sorghum, and both men and women cut sorghum and harvest. However, the areas planted to yams are considerably smaller in most Savanes regions (due to the depredations of elephants, as well as lesser rainfall) than around Bassar and the areas planted to sorghum and millet are larger: the result is probably that women take on a greater proportion of agricultural work than they do further to south. Farmers often invite neighbors to help weed fields and offer them food (often killing an animal) and drink (kwaperkit). Women often form teams to successively weed each others' plots; these are also called kwaperkit.

4. The Tchokossi (or Anufom) and Gourma:

According to Norris and Heine (n.d.7), the Anufom settlement at Mango reflects the lay-out of a military camp in which the compounds of military commanders, or donzom and those of the Islamic scholars who accompanied them (karamon) were protected by an arc of compounds of commoners (n'gye), descendents of the Agni foot soldiers who had originally manned the expedition. Donzom is derived from the Manding donso, meaning hunter, karamo is derived from the Manding address term for an Islamic scholar, and n'gye is derived from the Agni term for red ant. However, although the categories recall the occupational castes of more northern groups, occupations like ironworking, or leatherworking are not carried out by endogomous castes (and indeed, ironworkers are not consiedered castes among the neighboring Moba and Konkomba). However, social mobility among traditional categories was rare, and most marriages

took place between members of the same stratum. There was, however, a limited amount of assymetric exchange: commoners gave wives to both nobles and scholars, nobles gave wives only to scholars, and scholars only received wives.

There was considerable competition among lineages within estates for pre-eminence, and both the German and French authorities were brought into the struggles among lineages for power. Until the German colonial period, only the scholar estate was devout and practicing Muslim, Nobles retained only some Islamic practices, and commoners worshipped their ancestors and a number of local spirits. However, just after the division of Togo between France and Germany, the local ruler of Mango enlisted the help of the French administration to break up the principal secret society, and in the years that followed, most commoners converted to Islam. Many of the newer converts had their sons educated by itinerant teachers rather than by the local group of scholars, and the return of these sons has begun to challenge the scholarly pre-eminence of the established elite.

Unfortunately, we know far less about how the Anufom farm than about recent changes in social structure. The feasibility study for an irrigation scheme at Tchiri includes a social-economic study (SOTED, 1981. pp 75-106), which gives little detail, but the economic study is more specific. Men usually clear land, and work groups of men occasionally form for this purpose. The socio-economic study expresses the concern that if land-clearing in one of the principal factors binding the patrilieal household together, "l'introduction des equipements mechaniques pour le defrichement des terres de la zone de Tchiri pourrait entrainer un changement dans la structure de la famille elargie particulierement dans la desorganisation progressive du groupe de parents fonctionnant traditionallement comme une cooperative." (ibid. p.89)[1] The study advocates forming agricultural cooperatives to rent tractors or manage draft-oxen teams, and in this way combatting the progressive degeneration of family ties. The economic study tells us that the average household contains about 8 persons, of whom about 5 are considered as participants (that is, persons aged 15 or older working full time or part time on the farm). Men form ridges, while women and children sow. Both men and women weed (although the team anthropologist was told in Gando that Tchokossi women seldom weed), men cut the stalks of sorghum while women and children cut off the heads. Both men and women transport grain from the fields; men thresh, and women winnow.

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[1]The introduction of mechanical equipments for clearing land in the Tchiri zone could bring about a change in the extended family structure, particularly in the progressive disorganization of the adult groups which traditionally function like a cooperative.

We have a very considerable amount of information available on the Gourma (or Gourmantche, as they are called in Upper Volta) on the division of labor within the household, on the family management of smallholder farms, and on the effects of animal traction, from studies carried out in connection with an AID integrated rural development project in the Eastern Organisme Regional de Developpement in Upper Volta. These studies include a very detailed ethnographic account of Gourmantche agriculture and farm management (Swanson, 1979a, 1979b) and a set of quantitative studies on the effects of animal traction use on household production (Barrett et al., 1981), based on a comparison of the most successful animal traction household with a randomly selected sample of households in the same zone using hand cultivation only.[1] The study found that successful animal traction using households had, on the average, 11.2 members and 4.71 participants, compared with hand cultivation households that averaged 7.7 members and 3.5 participants,

The categories of unclaimed land, land cultivated (and therefore claimed) by patrilineal kinsmen, and land claimed by other is complex (Swanson, 1979a. pp.4-28). A farmer gets access to land either by having been the first to clear unclaimed land, by inheriting claimed fallow land from male kinsmen, or by borrowing land from a non-kinsmen. Most farmers are willing to lend land that is available. Since trees are considered to be owned by whomever plants them, however, owners would be very reluctant to let a borrower plant trees on a borrowed plot. A stranger wanting to settle in a village would first get clearance from the chief to settle, and then get access to land by clearing it himself from unclaimed land or by borrowing it.

As a village grows, unclaimed land within reasonable travel distances becomes more and more scarce. As farmers go farther and farther in search of unclaimed land, they sometimes establish fields that are too far away for daily travel back and forth to the village, and build temporary shelters near the fields. Over time, these settlements can grow into cultivation hamlets, and, if a year-round source of water is available, they often develop into permanently inhabited villages.

There is some potential in such a system for inequalities in access to land to develop. Generally, the earliest settlers in a village have the most access to land that has had a long fallow period, and newcomers to relatively large villages in densely settled regions are most likely to have difficulty in getting access to suitable fallow land. It is likely, therefore, that village size will have some effects on land use patterns and farming methods.

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[1] The samples were predominantly Gourmantche, with some Mossi and a few Peul.

There was some evidence that the samples of "best farmers" interviewed (traditional and using animal traction) were more likely to have access to land they had cleared or fallow land they had inherited than other farmers, and less likely to have to borrow fields. It would be interesting to use the larger survey data sets to see if the same was true of farmers using animal traction. To return to the organization of work within the household, both men and women participate in all stages of field work. All agricultural workers in the household usually spend the first part of the day cultivating the grain fields or small plots of other crops during the very early morning or late afternoon. The production of these plots belongs to the individuals that farm them. Thus, a small sample of better farmers' households near Fada N'Gourma showed that of the land, the household members as a whole planted in seed grain (5.3 ha), about 76 percent was owned by the head of the household, about 12 percent was farmed by individual men (Swanson,1979a, p.66). Of land planted in other crops (averaging about 1.8 ha per household), 43 percent was farmed by the family head, 32 percent by women in the household, and 26 percent by other men in the household.

Table 4 shows the allocation of labor for a larger sample of randomly-selected hand-cultivation households compared with the best of the animal traction households. The average number of hours worked per day for men in animal traction households was only slightly less than for men in hand-cultivation households, but the hours worked per day for women in animal traction households was considerably lower. However, the reduction in average hours worked per day by women cannot be attributed to animal traction alone. Indeed, women in animal traction households spent a greater proportion of their working time on household fields than women in hand-cultivation households. Rather, the decrease in average time worked for women in animal traction households should probably be attributed to the larger average size of animal traction households and to economies of scale in women's household chores, which permit women in animal traction households to considerably reduce the proportion of time to devote to these tasks (Barrett et al., 1981. p.105).

C. On our knowledge of social organization in Northern Togo

How much do we know about how the project's target population is organized? The brief summaried presented in this section show that fairly good ethnographic data are available for some of the ethnic groups in the project zone (the Kabiye, the Konkomba, the Bassari, the Kotokoli, and the Tchokossi), but that most of the information we have is twenty or thirty years old. Even for the groups where we know the

"traditional" system in some detail, we don't know how changes since independence have affected the traditional system. The studies we have, date from before ethnographers collected systematic quantitive data, and the economic data are slim.

We know very little about the degree of inequality of income among households in a given area. Many of the societies we have discussed were traditionally acephalous, and it is often the case that pronounced economic stratification is most likely to be present where political structure of a society is highly developed. However, we have little or no idea what has happened to traditional economic structures since independence.

Another problem with ethnographic accounts is that they tend to neglect a typical case. For example, divorce rates are relatively high in many of the societies we have discussed and some regions of northern Togo traditionally had high rates of male outmigration. However, we know little about whether there are significant numbers of female-headed farm households and how they manage. One extension worker, when questioned, said that such households generally concentrate on food crops rather than cash crops. It is likely, then, that they receive little in the way of extension services.

The more recent ethnographic information we have is of uneven quality; the ethnographic accounts in the SEDES studies of the region give too little detail to be of much use (Mirival and Agbegninou, 1974; Tourne, Djangbedja and Affognon, 1974). Recent sociological inputs to Projet Vivrier havedone little to update our knowledge of the Kabiye and Lamba (Schwartz, 1980, 1981). The sociological study that AID recently funded as part of the feasibility studies for the Tchiri perimeter (SOTED, 1981) is of largely doubtful value.

The decennial agricultural census, currently underway, could give a good deal of information, but the published analyses for the 1972-73 and 1973-74 census shed only feeble light on the structure of farming households. Since the monitoring and evaluation unit in TAT proposes to base its work in part on the 1982 census, it seems worthwhile to offer suggestions. One problem is that the 1972 forms did not record ethnic affiliation of the household, and another is that while circumscription was recorded, the only tabulations that are published for the household data are by region.

Although the analysis of the data on population and labor force asserts that most heads of farm units are men, it does not give any data at all on the subject. (A small-scale investigation in the Maritime region showed that over a third of farm units were headed by women. SOTED, 1982). Table 5 summarizes some of the available information on farm household size and compositions. The average number of persons

Table 4: Allocation of potential labor time to leisure, farm and non-farm activities: Eastern ORD, all zones.

	manual households	ANTRAC households
Number of households	36	41
Hours worked per day - household	6.5	5.6
- men	5.5	5.4
- women	7.4	5.8
Proportional allocation of hours worked	(percent)	
- Household fields - household	40.5	44.1
- men	57.4	56.2
- women	26.7	35.6
Livestock raising - household	6.9	8.6
- men	12.5	14.4
- women	2.7	4.2
Household chores - household	27.7	22.0
- men	3.7	3.5
- women	46.0	35.2
Agricultural transformation - household	10.4	8.9
- men	0.5	0.8
- women	18.5	14.8
Agricultural trading	1.8	4.4
- men	2.9	5.4
- women	0.9	3.9
Other (wage, labor, construction artisanal, small industry, school) - household	12.7	12.0
- men	23.0	19.8
- women	5.7	6.3

Source: Barrett et al., 1981.

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Table 5: Summary of household information from 1972-74 agricultural census.

	Avg. no. persons	Avg. no. wives	Avg. no. children	Avg no. other relatives
Region Centrale	7.98	1.48	3.63	1.87
Circ. Bafilo	10.04			
Circ. Bassar	7.84			
Region de La Kara	6.99	1.36	3.77	0.86
Circ. Kande	6.75			
Circ. Lama Kara	7.69			
Circ. Niamtougou	6.20			
Circ. Pagouda	6.90			
Region des Savanes	10.18	1.61	1.26	4.64
Circ. Dapaon	11.37			
Circ. Mango	6.72			

Source: Republique Togolaise, Ministere du Developpement Rural, Direction des Enquetes et Statistiques Agricoles. 1976. Enquete Agricole, Campagnes 1972-73 et 1973-74. Togo.

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per household is clearly higher in the Dapaon and Bafilo circumscriptions than elsewhere. Unfortunately, other information is presented only by region. It seems, however, that the larger number of members in households in the Savanes and the larger number of agricultural participants is chiefly due to a larger number of persons outside the nuclear family in households in the Savanes.

D. How do they farm?

One of the lessons donor organizations have learned working in West Africa over the past years is that farming in the Savana area can be difficult. Indigenous farming technologies have often evolved

fairly sophisticated ways to deal with uncertainty over the distribution of rainfall on the Savanna and with the need to increase labor intensity where available land for agriculture is limited (Netting, Cleveland and Stier, 1980). In planning an agricultural project, it is useful to have a rough idea of the current farming system in each of the project districts, and to have a guide to the vocabulary farmers use in describing their own technology.[1]

Animal traction projects have a few more specific problems to face. Traditional farmers often prefer to cultivate several crops in association (e.g. sorghum, millet and legumes). Intercropping has many advantages: it reduces the risk of crop failure through disease or infect infestation, it makes for an "implicit rotation" within each year (rather than between years), and it provides substantially higher returns per hectare and per hour worked than pure stands (Norman, cited in Metting et al., 1980.p 332). However, devising intercropping patterns that allow farmers to use the equipment for weeding has not always been easy. For example, where early millet and late millet or late sorghum are to be intercropped, the farmer has a choice of planting them in the same rows, or of planting the late grain in parallel rows, 80 cm apart,and close to the early millet. This system requires some extra hand-weeding until the early millet is harvested, but allows the farmer to ridge mechanically after the early millet has been harvested. Swanson (1979b. p.109) found Gourmantche farmers generally preferred the second system.

1. Bassari and Kotokoli

Both the Bassari and the Kotokoli cultivate roughly the same crops: yams, sorghum, short-cycle and long-cycle millet, maize, Kersting's groundnut, peanuts, taro, sweet potato, cassava, Bambara groundnuts, rice, and fonio. The Bassari cultivate cowpeas (Vigna); the Kotokoli seldom do. Peanuts and cotton have been cash crops since at least the 1930's. Both the Bassari and the Kotokoli plants yams in mounds and sorghum and other grains on ridges, and the only organic matter incorporated into the earth is weeds, which are buried during land preparation. A very typical rotation starts with yams, planted either the year a plot is cleared and burned or the subsequent year, followed by sorghum interplanted with different varieties of beans or peanuts and corn, followed by an indefinite number of years of alternating yams and sorghum without associated crops, followed eventually by fallow (Froelich, Alexandre and Cornevin, 1963. pp. 17-21; Cornevin, 1962. pp. 98-101; SOTED/BCEOM/BDPA, 1981. p. 88).

[1] Transcriptions of some terms are rough; and it was not always possible to check them against a standard orthography.

2. Kabiye, Naoudemba and Lamba

The Kabiye are one group of several non-Muslim farmers who keep livestock in hill regions in the West African savanes that have evolved very complex and labor intensive cultivation methods. Others include the Kofyar of the Jos region in Nigeria, the Mafa of the Mandara mountains in northern Cameroun, and the Dogon of the Bandiagara plateau in Mali. Such cultivation system often traditionally included intensive use of manure from stabled animals, household refuse, slope-retention or terracing techniques, ridging, tied-ridging, and mounting techniques (cited in Netting et al., 1980. pp. 192-197). The intensity of cultivation of different plots of land often reflects the distance from the compound; thus, land nearest the houses is often heavily manured, permanently cultivated, and scrupulously weeded, while fields more distant from the house receive less manure (although plant material may be incorporated into the soil) and are cultivated less continuously.

According to Sauveget (1962.p.12), the Kabiye call the zone around the compounds dessida, (although in Tchichao, Kabiye refer to this area as nono hayim). At any rate, it is this region that is most carefully terraced and manured. Early bulrush millet (milo, misi in plural) is planted there in late April or early May, and is one of the first crops that can be harvested during the hungry season before the principal grains are ripe. Early maize (samala) is often also planted there and dominate the space after millet is harvested. It is harvested green during July and August, and the leaves are one of the main forages for smallstock during the rainy season (Cridel n.d.8). Greens (nyatu), gumbo, peppers, tomatoes, taro, and tobacco are also often cultivated in the house plots. Most of the protected trees are also found around this zone, they include baobabs, mimosa (nere), oil palms and mangos.

Outside the house fields, there is a zone of bush fields, called tare (Cridel, 1969.p.13) or te hayim, which are periodically fallowed. These fields are generally planted to sorghum (mila) and late millet (amala) intercropped with peanuts, or else to yams. Cridel writes that the late millets and sorghums both take eight months to maturity, however, the varieties described to the team anthropologist were:

kohoulemain - 6 months, white sorghum, higher yielding than other varieties, but less well liked for beer;
kiseme - 5 months, red sorghum, more drought resistant than kohoulemain, and good for both beer and pate.

Sorghums are sown at the same time as the early millet and maize, and are usually interplanted with peanuts, either the local variety (ketu), or a type brought from Benin (dahome).[1]

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[1] Extensions agents usually prefer that the recommended variety, RMP-12, is planted in pure stands.

The sorghum receives a first weeding (akoza) in June, and a second weeding (alula) several weeks later. The stalk is ridged (ebahu) in September.

The amount of land Kabiye or Lamba farmers plant in yams is variable. In some areas, it is considerable. For example, data from Project North-Togo shows the following proportions of yam fields: 33 percent in Landa-Pozenda, 26 percent in Binah, and 9 percent in Helota (Bossi, 1980); an animal traction farmer-adopter in Pagouda had planted about 30 percent of his cultivated area for this year in yams, according to the notes of the PCV who measured his fields. Kabiye distinguish several types, among them:

kabange - "twisted" yams, earliest cultivar, low yield;
he abala - early yams, called "male" because they're larger;
he aloseo - late yams, called "female" because they're smaller.

The late yams are planted in February in mounds about .5m tall, and harvested in October; the early yams are planted in November in mounds about 1.0m high, and harvested in October, during the so-called "hunger" period. One limiting factor for the amount of yam cultivation is the amount of work needed to make the mounds; another is the heavy cost of planting material, about 4.000 CFA for 30 mounds.

Toward the end of the wet season in July and late August, some households plant sweet potatoes, sweet cassava, and Bambara groundnuts in mounds about .5m high. Rice is sometimes interplanted in these fields. In addition, households in some areas have started cultivating vegetables on the edges of low-lying areas (bas-fonds).

Rainfall decreases sharply north and west of Niamtougou, and the soils in the Lamba and Naoudemba areas are also said to be less fertile than on the Kabiye plateau. People use ridges, tied ridges, and contour dikes to retain water and slow erosion. Some areas apply manure and household refuse to fields, and many areas use leguminous crops and incorporate plant material to enrich the soils. Fonio takes on greater importance as a hungry-season crop. In most other ways, however, crops and techniques resemble those used in the Kabiye area.

3. Konkomba

Although Froelich et al. group the Konkomba with the Moba in most respects, the Konkomba names for crop varieties from around Guerin Kouka are very like those from around Bassar, (and techniques appeared similar), while the Moba crop names and techniques seem much closer to those of the Gourma to the north. Froelich (1953. p. 56) writes that the Konkomba don't manure their fields and are less careful to take advantages of nitrogen-fixing legumes than the Kabiye. A

common rotation pattern starts with yams, the year after a field is cleared (interplanted with early millet and other crops), the sorghum, usually interplanted with peanuts, and eventually fonio.

The bulrush millets most common in Guerin Kouka were:

inya - an early millet cultivar brought in from the Kabiye area;
iyo nokpur[1] - four-month millet harvested with a long panicle;
iyo dja - a three-month millet used when the rains are late, with a shorter panicle, about 20cm.

When Froelich wrote, he found only one early millet variety. Maize is widely cultivated today, both a traditional variety, ekkama me, a relative drought-resistent red variety, La Posta maize, and F-4, an early-maturing hybrid variety.

Although Froelich recorded seven sorghum varieties (1953. p.56), the anthropologist was informed of only two traditional cultivars:

idi je (or ididye) - a red sorgum maturing in six months;
idi mai - maturing in three months.

Nella 219 peanuts have been tried in the area; it matures early (three months), but stores poorly and people don't much like the taste. Traditional peanut varieties included:

diabo - with two seeds, three-month maturation and high oil yield;
adiora - with three seeds, four-month maturation, eaten roasted; and
RMP-12.

Yam fields are cleared around six months before planting, and are planted from roughly December to March, according to Froelich, but the PCV who worked in the area noted there were plantings at several times during the year. The team anthropologist was told the principal types were:

larbaco - matures in four months, harvested in September or October, preferred taste, and most commonly sold commercially;
kpinah - somewhat later maturing (five months), harvested in November or December, covered with small hairs, widely sold commercially;

[1] Froelich notes that the IFAN-approved orthography is iyu.

kikki - late maturing (December or January) with small tubers, five or six per hill. People dig them up while working on new mounds and roast them in fires in the field;
sakkata - later than kikki, harvested early in the dry season;
kpilindou - like kpinah, matures in five months, but hairless;
bayer - late variety with whitish skin. Breaks easily, and so is hard to harvest and transport;
four - late variety that resembles kikki, but with darker skin;
diatouba -harvested after kpinah, with somewhat smaller tubers.

It is said that a good farmer will do 2 to 4 ha. of yams, often paying 60.000 to 80.000 CFA for the labor to form the mounds. The problem, of course, with a predominant reliance on yams is that projects have made little if any progress in finding ways to mechanize any of the field work.

Cassava is relatively little cultivated, the main types being:

bantye pi - with a white tuber, not liked in pate preparation;
kal ba - red variety used for pate;
mbanly maing - imported from near Ghana.

4. Tchokossi

Time spent by the team anthropologist in the field in the Tchokossi area was even more limited than elsewhere. Name-finding for cultivars was even more difficult to transcribe than elsewhere, and even less was found in the way of published enthography to verify orthography than elsewhere. Therefore, this description is pretty cursory. Like the Gourma, the Tchokossi seem to have a whole range of sorghums with maturation periods ranging from six months downwards. If the rains seem to start early and to show promise of continuing regularly, people try to cultivate the long-season varieties; where the rains are late, or where sorghum has to be replanted because of a dry period after the rains have started, farmers start sowing the shorter season varieties. The type of soil also affects the choice of cultivar. For example, clayey fields in higher areas dried out faster than sandy low-lying areas, and so were more likely to be planted to shorter season sorghums.

Most households plant early millet near the concession so they can scare birds off the crop. Fields around the house are not manured. There is also a short-cycle millet that is planted later in the season,

if rains seem likely to end early. Many people plant considerable amounts of cotton, and, to comply with the SOTOCO planting dates, many interrupt their planting of grain crops to finish the cotton fields, and then resume planting grain, using the shorter season varieties.

La Postamaize is grown widely, often interplanted with sorghum and even fertilized (one farmer interviewed was using one 40 kg sack of 15-15, but didn't know the area of his field. RMP-12 peanuts and Allen cotton are also planted and fertilized.

5. Gourma and Moba

Because much of the prefecture of Dapaon resembles the southern parts of Upper Volta in soils and rainfall, and because many groups of Moba were politically subject to Gourma principalities, it makes sense that there should be a good deal of similarity between the two groups in agricultural techniques. In the households interviewed at Nayega and near Barkoassi, Gourmantche names were used for millet and sorghum cultivars (though not for maize). However, there is considerable local variation in any large ethnographic area, and so it is to be expected that not all aspects of farming in Moba areas would resemble ethnographic accounts of Gourmantche farming (Swanson, 1979a, 1979b), which draw mostly heavily on experience around Fada N'Gourma. It would be very worthwhile for PCVs or TA doing agricultural extension in Dapaong to obtain a copy of Swanson's work[1] and with more time and more experience in the area to verify in more detail the similarities and differences.

In both Gourmantche areas and Moba areas, the land nearest the compound receives whatever manure and household refuse is available, and is often planted with early millet and with maize. The Moba term for the in-field is chinchen kuab, (as constrasted with bush fields, or fua kuab. Generally, fields near the houses in Nayega were intercropped with six-month millet in addition to maize and early millet, but some households planted only early millet in order to be able to graze smallstock near the house in the later part of the rainy season.

In Gourmantche households, the physical layout of th plots is similar, but the way they are conceptualized is a little more complicated. Households' heads have one or more large "grain fields" (kauana), and persons other than the household head may have one or more extra grain-fields (suali-kuanu) outside the village. In addition, all household members may each cultivate small plots within the village (lifeloli) planted to maize, early sorghum, millet, tobacco,

[1] A copy is on file with OAR/Lome and in ORSTOM's Lome library.

osoango - an early-maturing bitter type which stores poorly, but is used for beer and as a substitute for early millet;
dagbani - 3 1/2 month cycle, cultivated mostly for beer;
conlooli - 3 1/2 month cycle, very susceptible to *Striga*.

E. On communication strategies: the uses of ethnoscience

In the brief fieldwork during this project design, the anthropologist was struck by how seldom the animal traction PCVs and extension personnel working outside their home region knew the names of the major cultivars their farmers were planting, and the major characteristics of those cultivars. In part, the aim of this section was to give workers in different districts a sketchy idea of some of the relevant categories their farmers use in thinking about what they farm. Ideally, there should be notes for each area (perhaps corresponding to the extension sub-region) that give the major cultivars for major crops, and the knowledge farmers have of the soil preferences, drought resistance, susceptility to disease and insect infestation and bird damage, storage characteristics, and the uses local households make of different cultivars. A couple of readings in ethnoscientific methods during in-country training might be very useful to PCVs, and, if translated into French, some of the material might interest Togolese section chiefs and give them somewhat better communications link with their local-level extension agents. Anyone with local-language fluency and a little persistence would be able to get a much fuller and richer picture of the ethnography of farming than was possible here. The work in eliciting these categories and the knowledge that accompanies them is good practice in listening to farmers.

If project (or central) funds are available to develop area-specific training materials of this sort, it might be very valuable if someone like Swanson (who is presently under a Purdue contract on the SAFGRAD farming systems research in Upper Volta) or another anthropologist with strong liguistic skills and an interest in agronomy could spend a month or so in the Gourma areas of Dapaon to verify how local practices compare with what had been observed in Upper Volta. Training units could be developed that would allow PCVs and Togolese extension people to develop similar cultivar and farming notes for their own regions.

ON THE EFFECTS OF ANIMAL TRACTION ON LABOR ALLOCATION

The basic labor allocation questions any animal traction project social soundness analysis has to address are whether the changes that adoption will bring into a household will affect household patterns of work in ways that permit the household to meet its global goals. Questions arise concerning the costs and benefits from alternative ways of handling livestock in savanna farming zones: entrusting cattle to semi-sedentary Peul herders (who themselves do some cultivation) with periodic culling of the farmer's entrusted herd for meat production or, farmers keeping draft animals on the farm, year-round. Much of the materials we have on this question comes from Delgado's (1978,1979) farming system studies of the Mossi and Bissa cultivators and of Fulani cultivators and herders in Tenkodogo, in southeast central Upper Volta (a short distance northwest from the Togolese border).

Under the entrustment system, farmers give their cattle into the care of Peul herders/cultivators throughout the year.[1] The farmer generally makes certain gifts to the Peul herder over the course of the year, typically (around Gando in Togo) about 20 kg. of sorghum or millet each harvest per animal entrusted, a similar payment of grain when an entrusted cow gives birth, and a small amount of money (1.000 CFA) if an animal is taken out of the herder's care (either by the farmer's taking it back, or because it is sold). In addition, the herder has the right to the milk and the manure the animal produce.

Peul women process and sell the surplus milk from the cows, and the household as a whole applies the manure from its own cattle and from entrusted cattle to its fields. Cultivators sometimes request some of the manure. Sometimes they are given permission to carry manure away from the corrals. Sometimes the Peul will agree to a manure contract (nadoine) in which the herds are grazed on the farmer's harvested fields during the dry season. In most cases, the cultivators getting the manure are expected to feed the Peul family for the duration of the contract, and in many cases the cultivators also pay a fee.

The herder manages the farmer's herd. If the farmer wants to sell the animal, the herder locates a buyer (either a collector for one of the larger cattle markets, or another herder) and communicates the offering price to the owner, who either accepts or declines. When an animal is taken ill suddenly, the herder contacts the owner if possible before selling it. but the owner is obliged to take the herder's report of the price and the necessity for selling the animal.

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[1] Farmers keep smallstock on the farm.

In Tenkodogo region, if the sick animal is taken to the veterinary service, the owner is notified, and is obliged to pay the cost of vaccinations and medicine. If an animal dies in the bush, the herdsman is supposed to bring the head of the animal to the owner for proof (Delgado, 1979. p.25ff). Predictably, farmers worry that they are cheated by the herdsman and accuse Peul in general of being prone to steal the cattle of owners.

Delgado's overall conclusions are drawn from linear programming models that are hard for an anthropologist to follow, but the reasons why keeping the bulls on the farm year-round would be difficult in Tenkodogo are fairly straightforward. One is the problem of forage and water late in the dry season, when herds and at least some adult male herders are obliged to go up river valleys in search of grazing areas, and to stay until the rains are well underway.[1] The herds are thus far away from the village at the time draft animals would be needed to prepare land. The Peul often plant later than other farmers in the village because some men are still on transhumance at the start of the rains. Another problem is that fields are not fenced, and the animals are difficult to control near the crops; again, during this part of the year, children cannot watch the animals alone, but must be accompanied by adult men. (Delgado, 1979. p.38). Delgado argues, first that there are economies of scale as herd size increases to about 40 animals (ibid:121). He also argues that the increased need for herd supervision during the rainy season conflicts with the peak labor requirements for grain cultivation (shown in Figure 5) in November. (The labor requirements shown are per hectare: few families cultivate as much as one hectare of rice, so that July peak is less serious than it looks, but many farm families cultivate more than a hectare of millet, sorghum, and cowpeas, so that the November peak is rather more important than it looks.) In sum, Delgado contends that the need for transhumance (due to lack of forage) and the need for male labor to keep animals out of fields during the cultivation season, would take labor away from cropping enterprises if farmers had to keep the animals on the farm year-round.

However, indications are that the forage problem is less acute in Dapaon (and considerably less acute in the Kara region) than in Upper Volta, and the distances travelled to find dry-season pasture are smaller. Therefore, when draft animals in Gando are entrusted to the Peul, it is still possible to retrieve them at the start of the rainy season for land preparation. Animal traction projects contend that draft animals are less likely to suffer injury if they are kept on the farm year-round and animal insurance schemes often refuse to cover death or injuries incurred while animals with the Peul. Delgado's work points out the crucial role that the availability of supplemental forage and dry season water sources play in the decision not to keep

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[1] Although small boys and girls can watch over animals for part of the year, they are not strong enough to dig wells in lowland areas or water the herds from existing wells.

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draft animals on the farm during the dry season.

However, Tenkodogo farmers are cultivating very little in the way of cash crops: about 83 percent of land is devoted to sorghum/millet/cowpeas fields. A later paper that compares Tenkodogo results with a farming system study of animal traction in the Operation Riz area near Segou in Mali showed that animal traction enjoyed much more in the way of benefits where the time for planting cash crops coincided with the heaviest weeding labor requirements for grain crops, and where the rented oxen hours could be substituted for hired manual labor in preparing rice seedbeds. However, the overall profitability of animal traction depended on having access to hired labor later in the season (Delgado and McIntyre, 1981. p.8). An idealized composite model,which gave a hypothetical farmer in Tenkodogo increased cash-cropping opportunities, showed that while there were extra costs to cropping grain with animal traction, there were increased returns to labor for cash crops, and that the profitability of renting ox teams and equipment grew with the proportion of cultivated area planted to cash crops.

In sum, opportunities for growing cash crops and opportunities for renting out ox teams and equipment during the period when seedbeds are prepared for cash crops, and for renting out ox teams and carts for transporting grain during harvest both substantially improved the profitability of animal traction use. However, in the model, the cost of extra hired labor for weeding continues to be a constraint to the profitability of animal traction (although a less severe constraint than the lack of food crops). This need for extra manual labor is tied to problems in adapting weeding equipment to local conditions: a survey of animal traction projects throughout West Africa has shown that a minority of farmers who could buy the weeding equipment used it. If a program of technical trials were able to modify the equipment to weed more effectively, the requirements for supplementary manual labor could be substantially reduced.

ON MOTIVATION AND ON THE NATURE OF PROJECT BENEFITS

The design team has assumed that the principal benefits to come from the project will stem from increases in labor productivity as farmer master animal traction techniques, as the technical package that accompanies the draft equipment is refined and as the equipment itself is more closely adapted to local conditions and practices. The principal goal of the project, then, is to increase farm production and thus to raise rural household income. But the question has to be asked if the marketing system and the producer prices will allow in-

creases in productivity to result in increased net incomes.

There is also a subsidiary question of whether raising household income is a valid goal for all the populations to be affected by the project. The technical analyses make it clear that one of the constraints that will be encountered in trying to make draft animals and traction equipment available to farmers will be the supply of suitable traction animals, and one of the long-term aims of the applied research component is to evolve a locally adapted herd management strategy that can be diffused to private herders in Togo to improve the supply of animals with the correct conformation for animal traction (and with good resistence to local diseases), while maintaining or improving the sustainable carrying capacity of available grazing land. We have seen that a good part of the Togolese national herd is either owned by or managed by herders under the entrustment system, and we have a certain amount of social analysis of the Peul that says essentially that any efforts to increase the productivity of herding in order to increase offtake rates for slaughter, or analogously to increase the number of animals kept permanently on smallholder farms, are bound to fail because the Peul in general live outside a commercial economy and have no use for money (Riesman, 1980).

However, Delgado's recent work shows that (contrary to findings elsewhere) Peul households in Tenkodogo are deeply involved in a market economy. Indeed, also output per worker of Peul households was roughly the same as for Mossi or Bissa households, cash income in Peul households was roughly four times that for Mossi or Bissa households (Delgado, 1979. p.98), and sales of cattle were by far the most important component of the cash income of households.

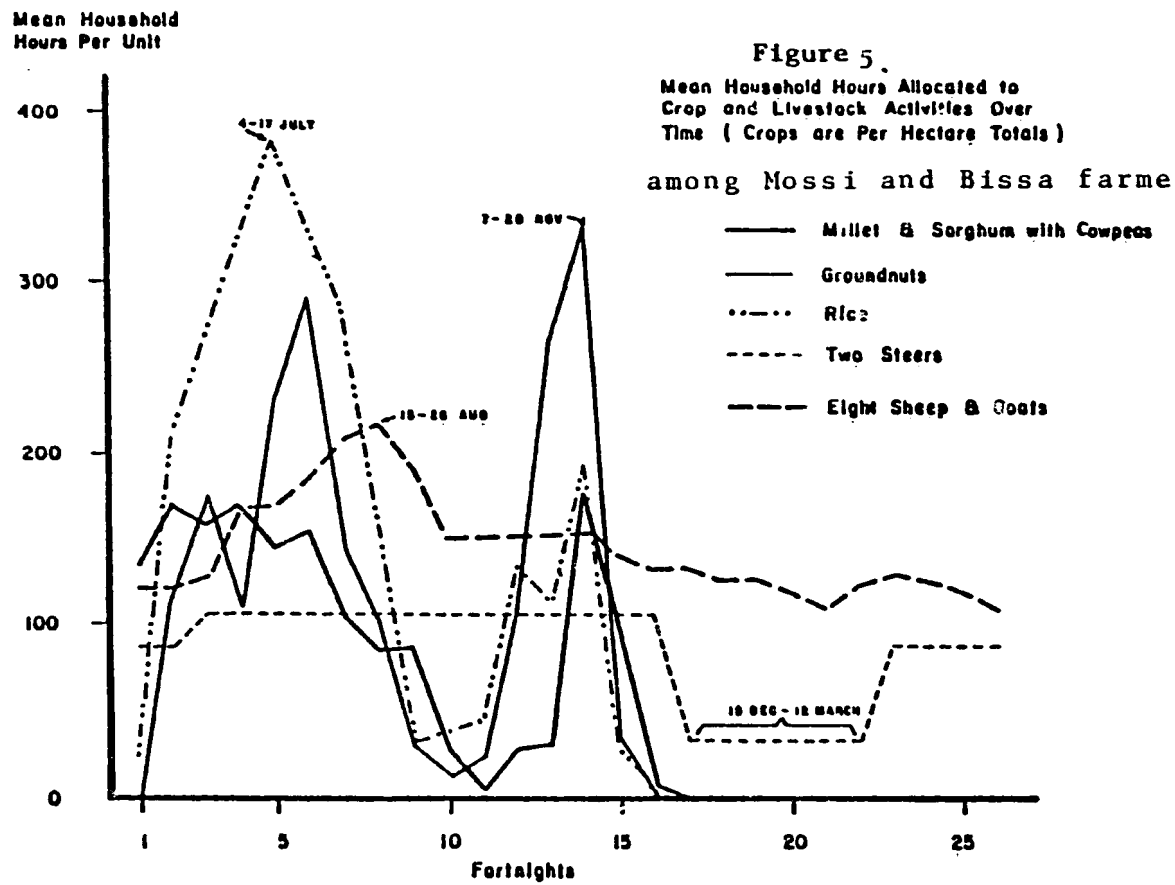
A rather graver concern is whether the current structure of producer prices will permit smallholder farmers to receive reasonable return to their labor. This is a concern the Economic Analysis discusses in far more detail, and this section will only sketch the outline of the problem. Project North-Togo recently tried to approach this question using labor input and yield data from a small sample of its farmers, and estimating the gross margin per work-hour. The project economist felt that a reasonable return to labor for farm families would have to be somewhat higher than the official minimum wage of 15.000 CFA in order to take into account the presence of older and more experienced workers in the household. They set their target income at 25.000 CFA per month, or about 142 CFA per hour worked.

Table 6 shows the gross margin per work-hour, evaluated at official producer prices for the five principal crops in the project zone. The small size of the sample makes some estimates suspect, but it seems clear that the returns to labor for peanuts, rice and sorghum are fairly low. Fortunately, the official Togolese marketing body

Figure 5.

Mean Household Hours Allocated to Crop and Livestock Activities Over Time (Crops are Per Hectare Totals)

among Mossi and Bissa farmers in Tenkodogo



Source: Delgado, 1978

(described in more detail elsewhere) handles a very small part of total marketed foodgrains--about 2 percent. However, recent efforts to increase amounts marketed through appointing buying committees, including local-level administrations, have a potential, at least, for abuse, and announced goals of rapidly increasing the proportion of marketed grain handled by official channels cannot fail to arouse concern. However, it seems that the most feasible way to work toward reconsideration of producer price policy is to strengthen the government's capacity to monitor agricultural household production and returns to labor under manual and animal traction (in much the same way as the government now follows consumer prices) in order that the costs of production be taken into account more accurately in setting acceptable price ranges. The thornier question of the effectiveness of TOGOGRAIN will have to be approached in a wider context than this project analysis.

ON MINIMUM PARTICIPANT PROFILES

A survey of West African project promoting animal traction suggested that the threshold farm size after adoption of animal traction would be about 4 hectares for use of donkey drawn equipment and about 6 hectares for use of bullock-drawn equipment (Sargent et al., 1981). However, this gives us little help in assessing a prospective threshold farm size, since we know very little about what increase in cultivated area can be expected under animal traction, although we know that most projects that tried to measure the increase in cultivated area found it was less than 30 percent.

Most of the data we have on cultivated area for the project zones come from the last agricultural census, and so are dated. They are shown in Table 7. Although the Agricultural Statistics Service continues to monitor yields in a sub-sample of farms, it does not measure cultivated area for the sub-sample, but estimates that cultivated area increases 2 percent (in global terms) a year from the 1972-74 base figures. However, farm areas published in Tourne, et al. (1974. p.39) and Miravel et al (1974.p.92) differ considerably from the census figures.

The census figures do, however, give us a very rough framework for comparison. The figures on cultivated area for 14 animal traction farmers in the AIP are probably in part estimates (almost all figures are rounded to the nearest quarter hectare) rather than actual measurements, and they are also distorted by the inclusion of three collective fields. Even omitting the collective fields, however, the median cultivated area for individual farmers was about 3.5 hectares which seems higher than in the population as a whole. Random samples of farmers

Table 6: Gross margin per work-hour for traditional and improved cultivated crop practices - Project North-Togo, 1981. In CFA at official producer prices.

	Traditional	Improved
peanuts	118	110
maize	331	183
rice	84	137
sorghum	115	
yams	348	

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from Project North-Togo zones in Landa Pozenda, Binah, and Helota also seem considerably larger than the census sample farms.

In sum, we seem not to have very good estimates of farm size for the project zone, and we have no very exact idea of the potential increase in cultivated area animal traction would make possible. Some of this information will probably be available when the current agricultural census is tabulated, but much of the information will have to be generated by the TAT Monitoring and Evaluation Unit. Because of the probable association between large farm size and higher propensity to adopt animal traction equipment, changes over time in cultivated area (or cultivated area per worker) are likely to be a more accurate measure of the effects of animal traction than comparison between manual cultivators and animal traction households in the same area.

However, it is possible to draw a few inferences from what we know. Dapaon, Mango, and Bassar circumscriptions seem to have larger farms, on the average, than Kante, Kara, Niamtougou, and Pagouda, and, if it is also true that more unoccupied land is available in those circumscriptions, TAT might do well to allocate extension resources toward those areas. Clearly, however, there is a need to adapt an animal traction package to the middle range of farmers, in part by reducing the amounts of equipment sold to farmers and tailoring the equipment package more closely to the locality, and in part, by adapting the technical recommendations that accompany the equipment. Again, this will be one of the tasks of the Monitoring and Evaluation Unit.

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Table 7: Distribution of farm size by Circumscription (percent)

Circumscription	less then 2 ha,	2 to 4 ha.	more than 4 ha.	total
Dapaong	18.5	37.7	43.8	100
Mango	67.2	23.0	9.8	100
Region des Savanes	31.0	33.9	35.1	100
Kante	83.7	12.2	4.1	100
Lama Kara	94.4	2.4	3.2	100
Niamtougou	97.8	1.1	1.1	100
Pagouda	95.1	4.9	-	100
Region de la Kara	93.1	4.4	2.5	100
Bafilo	87.4	6.3	6.3	100
Bassar	48.9	34.1	17.0	100
Region Centrale	55.1	32.2	12.7	100

Source: Agricultural Census, 1972-74.

Table 8: Size of farms in hectares: Project North-Togo zones of operation

Zone	1 ha,	1-2 ha.	2-3 ha.	3-4 na.	24 ha.	Total no.
Landa Pozenda	2%	24%	24%	18%	32%	50
Binah	10%	28%	34%	24%	12%	50
Helota	3%	12%	23%	16%	46%	90
Total	4%	19%	26%	18%	33%	190

Source: M.Bossi, 1980. Donnees structurelles essentielles sur les exploitations agricoles dans les zones d'action du Project Nord-Togo. Mimeo. Kara

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ON TRADITIONAL LAND TENURE SYSTEMS AND ON RECENT LAND REFORM LEGISLATION

Although it is common to say that traditional land tenure systems hold land as collective property, most of the information we have on land tenure suggests that in many areas, most cultivated land is held by individuals rather than collectives, and there is evidence from other areas that as categories of land become more valuable and more scarce, ownership is more likely to be individual. In most of the areas for which we have information, there are means to allocate or lend land to those who need it, with the borrower making at most token presents to the lender. A survey in the Gourmantche area asked landowners how willing they would be to lend land to a non-kinsman, and most respondents said they were willing. However, in many areas, the crops or trees that a person plants are seen belonging in perpetuity to the planter, and so, if a land-borrower plants trees on a plot, he can be seen as trying to lay permanent claim to the land.

The ethnographic evidence we have, therefore, would suggest that traditional land tenure systems would have ways of allotting land to farmers who wanted to expand cultivated area and so would pose no insuperable obstacle to expansion of cultivated area under animal traction. However, it is necessary to remember that the ethnographic accounts we have are old, and tend to be based on how people say the systems works, rather than on the observed incidence of different kinds of land tenure disputes. It may also be the case that increasing density of settlement has altered land tenure systems significantly.

In addition, there is the problem that land is passing out of the traditional tenure systems. The Government of Togo has initiated a program of land reform that consists principally of: legal registration of land ownership (Ordonnace No. 12 du 6 Fevrier 1974); establishing means of bringing land under government ownership, or under control of cooperatives; establishing procedures to consolidate land holdings; and establishing the Direction de la Legislation Agro-Fonciere, in the Ministere de l'Amenagement Rural to oversee land reform. The aim of land reform is not to redistribute large-holders' lands (as in Latin America), but rather to make land available to the state for development of irrigated perimeters, for resettlement programs, for game reserves and restricted forests, or for other development purposes.

One of the functions of the Monitoring and Evaluation Unit will be to keep track of changes over time in land use patterns, through aerial photographs and Landsat imagery. Some kind of tracking ability for the actual availability of land would be valuable, perhaps by adding a question to the agricultural census form (which already includes questions on parcels of fallow land) on the approximate duration of fallow on different parcels that are being put back into production,

or by questions about whether the farmer is finding it difficult to locate or borrow suitable land.

CONCLUSIONS

The ethnographic data on the diverse groups in the project region vary greatly in age and in quality, and efforts by AID to fund additional sociological studies have not yielded useful results. Although the GOT and several donor organizations have tried to establish pre-cooperatives able to invest in agricultural equipment and manage it, the experience of the Animal Traction AIP with cooperative ownership has not been good, and it seems preferable that the project try, where possible, to give credit and equipment to single families rather than cooperatives.

The information collected in the ongoing 1981-82 agricultural census could be much more useful than that of the last agricultural census if it is more completely analyzed and interpreted. Statistique Agricole tabulated the last census by hand (although there was supposed to be provision for use of computers); use of machines with SPSS could give a larger number of multiway tabulations with more detailed categories (e.g. prefecture rather than region).[1] If the Monitoring and Evaluation Unit uses the agricultural census as the basis for its own work, it might be valuable to verify that the questionnaire actually inventories fields belonging to or cultivated by all members of the household, since the last agricultural census arrived at very small total cultivated areas in some regions, and since the linguistic intricacies of field categories may mean the surveyors are omitting to ask for some kinds of fields.

The relationship among variables like access to land, household income, family size, and propensity to adopt animal traction equipment (observed in southern Mali and eastern Upper Volta) could make it difficult to disentangle the causes and the effects of the use of animal traction. For example, we have seen that in the Eastern ORD, women in animal traction households work fewer hours per day than women in other households. but that most of the difference can probably be attributed to the larger size of animal traction households and to economies of scale in domestic work.

Although Delgado made a strong case that the entrustment system in Tenkodogo had lower costs and higher returns than animal traction in which farmers kept animals on the farm year-round, northern Togo differs from southern Upper Volta in several significant ways.

[1] SPSS is the Statistical Package for the Social Sciences.

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Forage and water may be more available during the dry season than further north, cash cropping is more prevalent, and rainfall may be less uncertain. The sum of these differences may mean that the costs of animal traction are somewhat lower, and the benefits (chiefly by allowing farmers to prepare land for cash cropping during the early weeding of grain crops) somewhat higher. However, water is a problem for some farmers trying to keep cattle during the dry season, and it would be advisable to try to coordinate work with the AID Togo Rural Water Supply Project and projects from other donors in order to try to situate wells in some zones where animals are being placed. Renting some pieces of equipment and teams has been profitable elsewhere, and the project might do well to encourage it, both as custom work by farmers owning draft animals, and by renting out equipment (like the carts) that may be too expensive for farmers to purchase. It should be possible to set reasonable user fees by experimenting. Other innovations that make dry-season use of animals more profitable should also be encouraged where possible--for example, by making some technical trials on using oxen for dry-season irrigated gardening, and then trying to coordinate with the work of gardening projects. It has been proposed that OAR/Lome design an ancillary small-scale rural works project midway through TAT, which could do a good deal to encourage use of animals for transport and dry-season garden use.

We have seen that (as elsewhere) traditional cropping systems use some labor-intensive methods of raising yields: ridging and mounding, construction of terraces, incorporation of manure and plant material into the soil and interplanting with nitrogen-fixing legumes (which gives an "implicit rotation"). In general, Peace Corps Volunteers and extension personnel transferred in from outside the region did not have a detailed knowledge of traditional farming practice in the district they were working in. Such knowledge should include the names of major cultivars, their relative yields, their growing period, and their relative resistence to drought, disease, insect, and other herbivore damage. Training in ethnoscientific methods would be very valuable for both PCVs and Togolese extension personnel, and could lead to developing notebooks on traditional cultivation practices (and on local experience with introduced practices) for each district. Such work could greatly improve communication among locally-recruited field extension agents, farmers, and higher level personnel.

Traditional land tenure systems have means for reallocating uncultivated land and should pose no barrier to the expansion of cultivated area through the use of animal traction. However, we have little current information on recent changes, and it may be the case that increasing population or the forced resettlement of some populations (for example, after establishment of the Keran game reserve) has increased population pressure on the land in some places and changed current land-holding practices.

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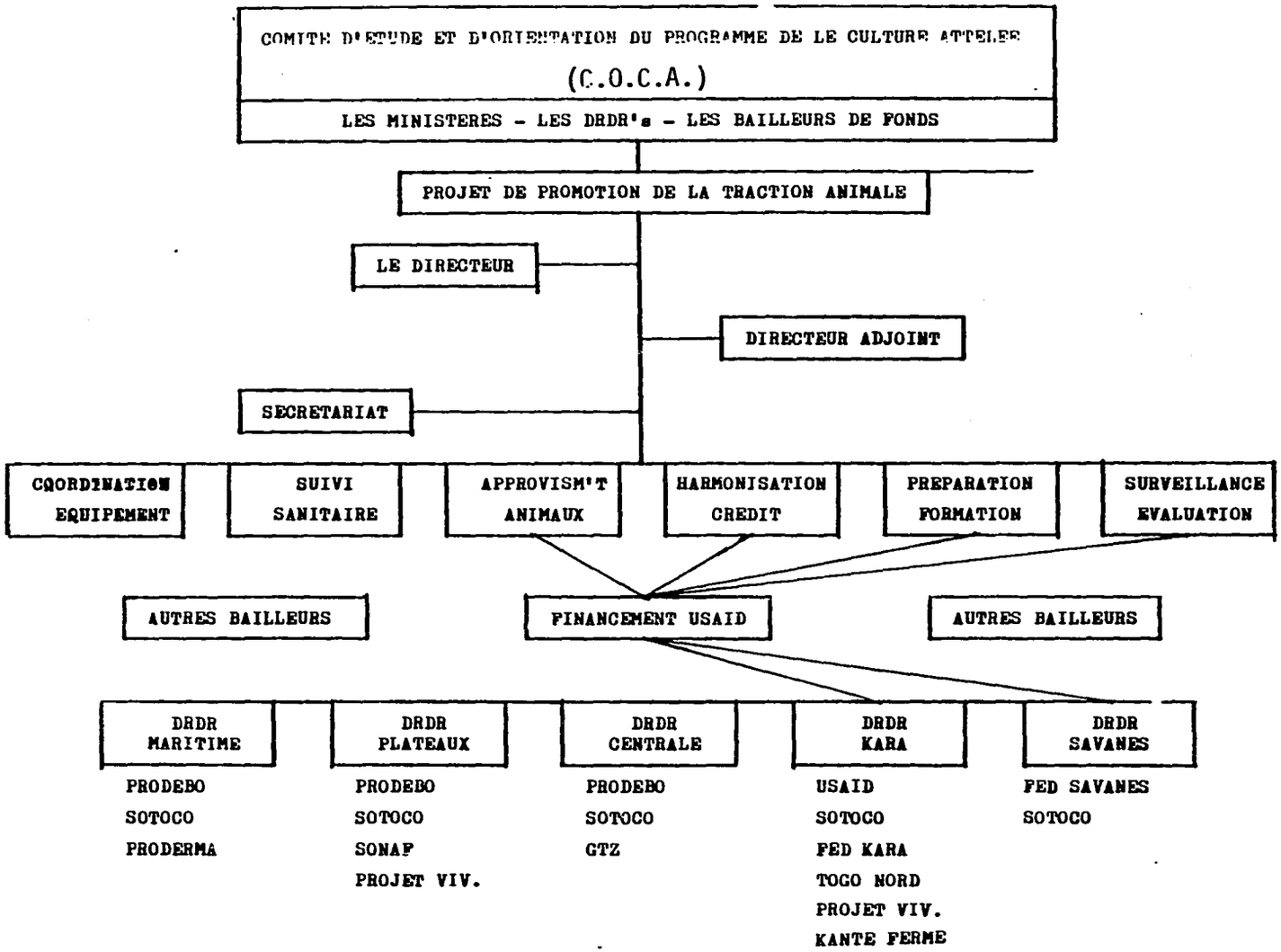
ANNEX FIVE

INSTITUTIONAL ANALYSIS

Table 1. Relationship of TAT to Togo Animal Traction Program & Other Donors



MINISTERE DU DEVELOPPEMENT RURAL

COMITE D'ETUDE ET D'ORIENTATION
DU PROGRAMME DE CULTURE ATTELEE
(C. O. C. A.)
SECRETARIAT PERMANENT
B. P. 82 - Tél. : 40-02-04
A T A K P A M E

N° 30/82/COCA

REPUBLIQUE TOGOLAISE
Union - Paix - Solidarité

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LOME, TOGO

A

Messieurs les Membres du Comité d'Etude et d'Orientation du Programme de Culture Attelée .-
(COCA)

-=-=-=-=-=-

Vous êtes invités à la prochaine réunion du COCA qui aura lieu à Lomé le mercredi 19 Mai 1982 à 9 heures à la salle de conférence de la CNCA à Lomé.

Ordre du Jour :

1- Rapport du Comité Restreint chargé d'élaborer le texte portant création de l'Organisme National de Culture Attelée.

2- Préparation de la campagne 1982-1983 : Programmation des commandes d'animaux, de matériel agricole, de blocs à lécher, du suivi sanitaire etc... .

3- Divers .-

Documents de travail :

1- Procès-verbal de la réunion du Comité Restreint du COCA chargé d'élaborer le texte portant création de l'Organisme National de la Traction Animale.

2- Projet d'arrêté portant création de l'OPTA

3- Projet de statuts de l'OPTA

4- Politique Nationale de Développement de la Culture Attelée./-

LOME, le 7 MAI 1982

LE PRESIDENT DU COCA
MINISTRE DU DEVELOPPEMENT RURAL

A. E. G A S S O U

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MINISTERE DU DEVELOPPEMENT RURAL 5 - 3 REPUBLIQUE TOGOLAISE

Union - Paix - Solidarité

COMITE D'ORIENTATION DU
PROGRAMME DE CULTURE ATTELE
(CCOA)
SECRETARIAT PERMANENT

Procès-Verbal de la réunion du Comité Restreint chargé d'élaborer le texte portant création de l'organisme National de la Traction Animale.

L'an mil neuf cent quatre vingt deux et le sept avril s'est tenue à Atakpamé dans la salle de conférence du PRODEBO, la réunion du COMITE Restreint du CCOA chargé d'étudier et d'élaborer un projet de statuts devant créer un organisme destiné à promouvoir les actions de culture attelée à l'échelon national.

Cette réunion a été présidée par Monsieur DOGBE Daké, Directeur Régional du Développement Rural de la Kara.

Etaient présents :

MM.	DOGBE Daké	- Directeur Régional du Développement Rural de la Kara
	BAYA	- Direction Générale de la CNC -Lomé
	EMOU Komlan	- Directeur du Génie Rural-Lomé
	ATTIOGBE	- Direction Générale du Plan-Lomé
	KOUMOUDAN	- Direction des Productions Animales-Lomé
Mme	ATCHOU	- Chef d'Agence de la CNCA-Atakpamé
Mlle	EDORH	- Direction Générale du Plan-Lomé
Drs	ADJI Zato	- Directeur des Services Vétérinaires et de la Santé Animale-Lomé
	APETOFIA Kossivi	- Directeur du PRODEBO-Atakpamé
	DOMINGO Moutiou	- Directeur-Adjoint du PRODEBO-Sokodé

Etait absent :

Mr.	DJALLA Pali	- Directeur Général de la SOTOCC-Atakpamé.-

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A l'ouverture de la séance le Président a rappelé l'ordre du jour de la réunion en demandant ensuite au Secrétaire Permanent du CCCA de procéder à la lecture du texte adopté par le CCCA sur la politique nationale de culture Attelée -

Les discussions de fonds et de forme ont porté sur ce document et celui du Projet de Statuts élaboré par le Secrétaire Permanent et distribué préalablement à tous les membres du Comité Restreint.

Après une suspension de séance à 12 H 30 les travaux ont repris à 14 H 30 par l'adoption de deux Projets de statuts et d'arrêté dont le texte est joint au présent procès-verbal.

Le Comité restreint a en outre proposé que les organismes suivants : USAID, FAO, Caisse Centrale de Coopération économique, PNUD, FAO, et CNG soient nommément cités comme membres du CCCA dans l'article 3 de la décision N° 577/MDR du 16 Septembre 1980.

Le document souhaite également que la prochaine réunion du CCCA soit convoquée le plus rapidement possible en vue de l'adoption du présent texte pour une mise en place accélérée du nouvel organisme.

Le document a été ensuite envoyé à tous les membres du Comité Restreint pour amendement avant sa mise en forme définitive.

Le Comité a également eu à déplorer le retard qu'ont accusé les notes d'invitation à la réunion et a souhaité que des améliorations soient faites pour les prochaines sessions.

La réunion a pris fin à 16 Heures ./-

P. LE PRESIDENT DU COMITE RESTREINT
LE SECRETAIRE PERMANENT DU CCCA

Dr ARETOFIA Kossivi
Vétérinaire-Inspecteur

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MINISTERE DU DEVELOPPEMENT RURAL

MINISTERE DU PLAN ET DE LA REFORME ADMINISTRATIVE

MINISTERE DES FINANCES ET DE L'ECONOMIE

5 - 5

REPUBLIQUE TOGOLAISE
Union - Paix - Solidarité

ARRETE N° ...../ DR/ PRA/ FE
Portant Création d'un Organisme de Promotion de la Traction Animale.

LES MINISTRES :

DU DEVELOPPEMENT RURAL
DU PLAN ET DE LA REFORME ADMINISTRATIVE
DES FINANCES ET DE L'ECONOMIE

Vu l'article 21 de la Constitution.

Vu les recommandations des 4e et 5e Conseils Nationaux du Rassemblement du Peuple Togolais.

Vu la décision N° 377/ DR portant création d'un Comité d'Etude et d'Orientation du Programme de Culture Attelée.

Vu le rapport du COCA sur la Politique Nationale de Culture Attelée,

A R R E T E

Article 1 : Il est créé un organisme pour la Promotion de la Traction Animale dénommé " OPTA " .

Article 2 : L'OPTA, chargé de l'application de la politique du Gouvernement en matière de développement de la traction animale, est doté d'une personnalité civile et de l'autonomie administrative et financière. -

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Article 3 : Les modalités d'application du présent arrêté et les statuts de l'OPT seront définis par le Ministre du Développement Rural.

Article 4 : Le présent arrêté sera publié au journal officiel de la République Togolaise.

Fait à Lomé, le

LE MINISTRE DU DEVELOPPEMENT RURAL

A. L. GAMBOU

LE MINISTRE DES FINANCES ET DE L'ECONOMIE

TEVI BENISSAN

LE MINISTRE DU PLAN ET DE LA REFORME ADMINISTRATIVE

KOUDJOLOU DAGO

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MINISTERE DU DEVELOPPEMENT RURAL 5 - 7

COMITE D'ETUDE ET D'ORIENTATION DU
PROGRAMME DE CULTURE ATTELEE
(COCA)

SECRETARIAT PERMANENT

REPUBLIQUE TOGOLAISE
Union - Paix - Solidarité
-=-=-

PROJET DE STATUTS
DE L'ORGANISME DE PROMOTION DE LA TRACTION ANIMALE
(OPTA)

-=-=-=-=-=-=-=-=-=-=-

TITRE I .-

CONSTITUTION

ARTICLE 1er .-

Il est créé par les présents statuts pour une durée illimitée, un Organisme chargé de la Promotion de la Traction Animale ~~(OPTA)~~, doté de la personnalité et de l'autonomie administrative et financière.

ARTICLE 2 .-

Le siège de l'OPTA est fixé à Atakpamé. Il pourra être transféré en tout lieu du territoire national par décision du Ministre de Tutelle, sur proposition du Comité d'Etude et d'Orientation du Programme de Culture Attelée (COCA).

ARTICLE 3 .-

L'OPTA veillera à l'application de la politique du Gouvernement en matière de développement de la Traction Animale dans le cadre de ses attributions.

TITRE II .-

OBJET ET ATTRIBUTIONS

ARTICLE 4 .-

L'OPTA est chargé :

...

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- de la collecte et de la diffusion de l'information en matière de traction animale;
- de l'approvisionnement en bétail et en matériel de culture attelée;
- d'assurer l'encadrement sanitaire et zootechnique du bétail de traction animale;
- de veiller à l'adaptation et à l'amélioration en général du matériel de traction animale;
- de la formation du personnel de vulgarisation et d'encadrement de la traction animale;
- de la préparation et du suivi, à l'échelon national, des programmes annuels de développement de la traction animale;
- d'une façon générale, de l'intendance des programmes de culture attelée.

ARTICLE 5.-

Le Directeur de l'OPTA assure en outre les fonctions de Secrétaire Permanent du COCA, et à la demande de celui-ci procède aux enquêtes et études nécessaires à la conception de l'exécution des programmes de Culture Attelée.

TITRE III .-

ORGANISATION ADMINISTRATIVE ET GESTION

ARTICLE 6.-

L'OPTA est administrée par une Direction assisté du COCA.

ARTICLE 7 .-

Le Directeur est nommé par arrêté du Ministre de Tutelle. Il est assisté d'un Directeur-Adjoint nommé par décision du Ministre de Tutelle.

Le Directeur peut consentir sous sa responsabilité personnelle des délégations partielles de pourvoir à des membres du personnel pour la gestion courante de l'Organisme.

Il a, en outre, de façon statutaire les pouvoirs énoncés ci-après :

- Organiser les structures de gestion de l'Organisme,de faire nommer par arrêté du Ministre de Tutelle, des collaborateurs techniques et les représentants locaux de l'Organisme;

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- Avoir la signature sociale;

- Nommer et révoquer le personnel de l'Organisme et fixer sa rémunération. Ce personnel est soumis à la règlementation générale en matière de main-d'œuvre;

- Gérer l'Organisme : le représenter en justice et dans tous les actes de la vie civile et administrative, à charge pour lui d'en rendre compte deux fois par an, au début et à la fin de la campagne agricole au Ministre de Tutelle;

- Préparer en partant du programme d'action prévu dans le cadre du plan, les tranches annuelles de travaux ainsi que les prévisions annuelles de recettes et de dépenses;

- Assurer l'exécution de ces tranches et en rendre compte au Ministre de Tutelle;

- Ordonner et liquider les dépenses; signer les ordres de recettes.

ARTICLE 8.-

Le COCA est informé de tous les problèmes d'ordre technique, administratif et organisationnel ainsi que tous ceux ayant trait à l'orientation du Programme de Culture Attelée.

ARTICLE 9;-

Les membres du COCA sont destinataires du rapport annuel de l'OPTA

ARTICLE 10 .-

Un Comité composé des services techniques du Plan et du Développement, de la Santé Animale, des Productions Animales et du Génie Rural sera chargé du Suivi et de l'évaluation de l'OPTA.

+ bayor du fond - 6 mois

ARTICLE 11 .-

Le Comité de suivi et d'évaluation fera des rapports annuels au COCA à la fin de chaque campagne Agricole.

TITRE IV

RESSOURCES

ARTICLE 12 .-

Les ressources nécessaires au fonctionnement de l'Organisme et à la réalisation de ses programmes comprennent :

- Le Capital Social constitué par une dotation entièrement souscrite par l'Etat;

...

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Les subventions, avances, fonds de concours ou participations qui lui sont attribués par l'Etat, les collectivités locales, les établissements publics et sociétés nationales, ainsi que par toutes personnes publiques ou privées intéressées, ou encore par les organismes étrangers ou internationaux;

- le produit de la gestion des biens entrés dans son patrimoine;
- le produit des emprunts qu'il est autorisé à contracter;
- les recettes résultant des services rémunérés et de la vente des produits de ses activités;
- le produit des taxes qui lui sont affectées;
- les dons et legs qui lui sont faits.

ARTICLE 13 .-

L'OPTA héritera des biens matériels, immobiliers et financiers de PRODEBO pour son démarrage.

ARTICLE 14 .-

Les opérations financières de l'Organisme sont contrôlées à postérioni suivant les règles en usage dans les organismes d'Etat.

TITRE V .-

AUTORITE DE TUTELLE

ARTICLE 15 .-

L'autorité de tutelle de l'organisme est le Ministre du Développement Rural.

ARTICLE 16 .-

Il reçoit copie des rapports du Directeur de l'OPTA et du Secrétaire Permanent du COCA.

TITRE VI .-

DISPOSITIONS FINALES

ARTICLE 17 .-

Les modalités pratiques d'application des présents statuts feront l'objet d'un règlement intérieur élaboré par le Directeur de l'OPTA et soumis à l'approbation du Ministre du Développement Rural.

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ARTICLE 18 .-

En cas de dissolution, les Ministres du Développement Rural, des Finances et de l'Economie, du Plan et de la Réforme Administrative prendront conjointement un arrêté nommant une commission aux fins de procéder aux opérations de liquidation.

ARTICLE 19 .-

Le Directeur Général du Développement Rural est chargé de l'exécution des présents statuts qui abrogent toutes dispositions antérieures contraires.

ARTICLE 20 .-

Les présents statuts seront publiés au Journal Officiel de la République Togolaise ./-

Fait à Lomé
LE MINISTRE DU DEVELOPPEMENT RURAL

A. E. GASSOU

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INTRODUCTION

Dans le cadre de la politique de la Révolution verte devant aboutir à l'autosuffisance alimentaire, les 4è et 5è Conseils Nationaux du Rassemblement du Peuple Togolais, analysant les problèmes relatifs aux moyens de production avaient mis un accent particulier sur la pratique de la Culture Attelée.

En effet, la recommandation N° 6 du 4è Conseil National tenu à Lomé les 10 et 11 Mars 1980 préconisait " l'introduction progressive dans le monde rural d'une technologie intermédiaire qui favorise la Culture Attelée et ouvre la voie de la motoculture ".

Cette idée a été reprise et renchérie par la résolution sur les moyens de production au 5è Conseil National en ces termes :" La traction Animale apparaît comme un volet très important de la mécanisation parce qu'elle est plus accessible et plus adaptée à la taille de nos exploitations. Devant la multiplicité des programmes actuels de Culture Attelée, la commission recommande de confier à PRODEBO la coordination de l'ensemble de ces opérations par la fourniture des moyens logistiques (animaux de trait, matériels agricoles et de transport, formation et suivi).

En outre elle recommande la vulgarisation la plus large possible de la traction animale et la création d'ateliers artisanaux de fabrication et d'entretien de matériels." Faisant donc leurs ces recommandations, les responsables nationaux du Développement Rural ont mis sur pied un Comité d'Etude et d'Orientation des programmes de Culture Attelée (COCA). Devant la nécessité de diffuser aux zones favorables du pays les techniques agricoles s'appuyant sur l'utilisation de la traction animale, et le besoin de coordonner les actions à entreprendre, les membres du COCA ont décidé à la suite de leurs réunions l'élaboration préalable d'une politique générale de la culture Ateelée qui, en fait, ne doit pas être en marge de la politique agricole nationale. Il est donc important d'intégrer cette action dans le contexte général du Développe- agricole en tenant compte des objectifs et des impératifs du plan 1982-1982. La pratique de la Culture Attelée ayant débuté depuis plusieurs années au Togo, l'on constate que son développement est soumis à des contraintes sociales, économiques et techniques auxquelles il faut trouver des solutions adéquates.

Ces contraintes se situent au niveau:

- de l'approvisionnement en animaux de trait, leur suivi sanitaire et leur alimentation ;

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- de l'approvisionnement en matériel agricole;
- du défrichement;
- du crédit, des subventions et de la commercialisation;
- de la formation et de la vulgarisation.

Le Comité d'Etude et d'Orientation des Programmes de Culture Attelée, (COCA) au cours de ses réunions s'est penché sur ces différents problèmes et en a dégagé ces quelques recommandations pour une politique générale de la Culture Attelée au Togo/

APPROVISIONNEMENT EN ANIMAUX DE TRAIT :

L'analyse faite de la situation du cheptel bovin Togolais montre que la production nationale actuelle est loin de satisfaire les bésoins en bovins. Annuellement le Ranch Adélé en démarrage ne pourra à sa vitesse decroisière fournir que 750 animaux de trait, tandisque l'Elevage sous-palmeraie de la SONAPH n'en fournira que 300 à 350. Les productions de Béna, d'Avétonou et de Namièlé suffiront tout juste pour la consommation en viande. Ne connaissant pas encore la structure des élevages traditionnels, on ne peut pas déterminer le nombre précis que l'on peut tirer de ce cheptel bovin.

L'approvisionnement de l'extérieur ne serait également qu'une solution précaire et incertaine. Il y a donc lieu de penser à des solutions d'approche conséquentes pouvant aboutir à des fins réalistes. Sur le plan de l'approvisionnement il y a deux actions à entreprendre:

A-1 ACTION IMMEDIATE :

Achat d'animaux aptes à la traction dans les troupeaux traditionnels; pour éviter la surenchère due à la présence sur les marchés de tous les projets à la fois, il est nécessaire de privilégier le seul organisme de coordination qui se chargerait de l'approvisionnement de tous les projets en animaux de trait. Cet approvisionnement se fera d'abord sur place à partir du cheptel national. Le déficit sera comblé par des importations à partir des pays voisins. Soucieux de protéger le cheptel bovin et la santé publique contre certaines maladies dont le zébu peut être le véhicule, il est à bannir à court et à moyen terme l'utilisation de cette race bovine pour la culture attelée.

Toutefois, les projets qui l'ont déjà introduit dans leur programme peuvent continuer son utilisation en raison de la pénurie actuelle en animaux de trait.

2°) ACTION A COURT ET A MOYEN TERME :

Le Gouvernement ayant fait de la culture attelée une option fondamentale, un effort tout particulier et soutenu devra être porté à la production bovine par une aide au développement de cette spéculation.

Une action vigoureuse sera entreprise au niveau des différents projets par:

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- L'acquisition de jeunes animaux pour le reelevage en vue de leur utilisation ultérieure pour la traction. Cela appelle à la mise en place au sein des différents projets de culture attelée, de petites unités de multiplication bovine et d'embouche;
- L'embouche de jeunes veaux sous-palmeraie sera encouragée tant dans le cadre de l'action de la SONAPH qu'au niveau des agriculteurs pratiquant la la culture attelée.
- Pour ce qui concerne les troupeaux tradionnels, l'introduction de géniteurs pour l'amélioration de la productivité et du format des animaux est nécessaire.
- Le service des Productions Animales devra être redynamisé pour la diffusion.

3°) SUIVI SANITAIRE ET ALIMENTATION

Une analyse faite de la situation générale montre que les Services de la Santé Animale et des productions Animales ne sont pas souvent associés à l'élaboration et à l'exécution des différents projets de culture attelée. Cette situation devra être désormais réglée afin que ces services soient intégrés dans l'élaboration, l'exécution et l'évaluation des différents projets de développement agricole. Pour éviter certains problèmes administratifs pouvant freiner l'action sanitaire au niveau des animaux de trait, les projets ponctuels de culture attelée bénéficient de l'appui sanitaire de la structure de coordination des opérations de traction animale. Une complémentarité est toutefois nécessaire avec le service de la Santé Animale dans le cadre de ses attributions nationales et qui dispose de personnel. Une convention sera signée entre les différents organismes et la structure de coordination pour les diverses prestations de service.
Dans le domaine de l'alimentation il y a lieu d'inventorier les sous-produits agricoles existant au Togo en vue de les mettre en valeur pour les animaux de trait.

Un accent particulier sera mis dans chaque projet sur les problèmes d'abreuvement des animaux de trait par des forages et la mise en place de points d'eau.

II LE MATERIEL AGRICOLE

La mise en place de l'UPROMA (Unité de Production du Matériel Agricole) résout en partie ce problème qui est très capital dans l'élaboration et l'exécution d'une politique de Culture Attelée. Toutefois des disposition devront être prises sur le terrain par la structure de coordination au niveau des différents projets pour dégager la fiabilité de ce matériel. La distribution et le service après-vente de matériel agricole seront assurés par la structure de coordination.

III LE CREDIT A L'EQUIPEMENT EN CULTURE ATTELEE

Le problème du crédit est très important et peut compromettre le développement de la culture attelée .

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Le défrichement des parcelles constitue l'un des goulots d'étranglement à la culture attelée, surtout dans les Régions Centrale., des Plateaux et Maritime.

Compte tenu du coût élevé du matériel lourd, de la dispersion des exploitations du paysan, et pour éviter son endettement, la formule souple à recommander au niveau des petites exploitations serait le défrichement à la main complété par un treuil Monkey qui serait utilisé pour le desouchement des gros arbres. Cette formule sera généralisée au sein des projets de développement agricole. Le paysan devra défricher, suivi par un encadreur, un minimum de 2 ha de parcelle pendant une période donnée pour commencer la culture attelée. Compte tenu de l'endettement déjà lourd du paysan que nous avons évoqué plus loin, l'utilisation du treuil sera subventionnée par les différents organismes de développement rural.

IV LA COMMERCIALISATION DES PRODUITS AGRICOLES

Rien ne sert de faire la culture attelée si le paysan ne peut pas y trouver un prix rémunérateur pouvant lui permettre de payer ses dettes causées par les différents investissements et de réaliser un petit bénéfice. Une politique de prix devra donc être instituée en tenant compte du coût de production agricole.

C O N C L U S I O N

A la suite de l'analyse de tous ces problèmes il est clair que le moyen le plus indiqué pour le développement agricole du monde rural Togolais est la Culture Attelée.

En effet, on sait que les méthodes culturales traditionnelles sont loin de pourvoir un accroissement quantitatif et qualitatif des productions agricoles.

Le coût de la motorisation dans le contexte mondial (inflation, renchérissement du coût du pétrole), compte tenu de la taille de l'exploitation du paysan grève lourdement ses charges. A côté de toutes les améliorations techniques pour la rentabilité de la culture attelée et dans le cadre du dévellopement de cette technologie intermédiaire des moyens de productions agricoles pour atteindre l'autosuffisance alimentaire, il est indispensable que des prix rémunérateurs soient accordés au paysan.

Le crédit devra être harmonisé à tous les niveaux. Un fonds de bonification uniformisé à prendre en charge par les différents projets sera crée au niveau de la C.N.C.A pour baisser le taux d'intérêt de la banque à l'instar des autres pays quiont voulu encourager cette technique culturale. La façon d'alimenter le fonds de bonification sera difinie en accord avec les projets et les sources de financement des différentes actions. D'autre part, il y a lieu d'envisager la création d'une assurance-bétail qui prendrait en charge les cas de mortalité d'animaux par accident, morsures de serpent ou maladies indépendantes de la volonté du paysan. Les frais d'assurance seront pris en charge par le propriètaire des animaux, le fonds géré par la CNCA, et la coordination assurée par la nouvelle structure. Le matériel agricole sera également subventionné en partie. Les subventions seront prévues au moment de l'élaboration des budgets des différents projets. Les subventions partielles et la bonification du taux d'intérêt se justifient par le fait que la structure actuelle de l'exploitation du paysan ne permet pas de rentabiliser l'opération. Pour ne pas donc décourager le paysan qui , par ses investissements s'endette lourdement, des actions vigoureuses et sociales s'avèrent urgentes

IV LA FORMATION ET LA VULGARISATION

Les échecs passés dans les tentatives d'introduction de la culture attelée en Afrique de l'Ouest en général sont dus à une insuffisance de sensibilisation des paysans avant la vulgarisation de la nouvelle technique culturale. D'autre part, la formation et la discipline de travail laissant parfois à désirer, car les encadreurs sont relativement laissés à aux-mêmes. A celà s'ajoute le manque de conviction des responsables techniques de l'encadrement Pour pallier ces problèmes il y a lieu d'adopter une stratégie globale de formation. La Culture Attelée doit désormais occuper une place assez importante dans les programmes de formation des élèves du CFPA de TOVE, notamment ceux des sections Agricole, Elevage et Génie Rural.

- Sur le terrain, la formation doit concerner tous les Agents à tous les niveaux d'encadrement. Elle doit désormais être polyvalente et se situer à 3 niveaux:

* Formation des cadres formateurs par la structure de coordination;
* Formation des artisans par la même structure pour la fabrication des pièces de rechange du matériel agricole de culture attelée dans les villages ;
* Formation des paysans par les encadreurs des organismes d'encadrement.

- La structure de coordination sera chargée d'organiser des stages de recyclage de courte durée, fera des projections de films par des tournées d'appui à la vulgarisation, des émissions radio-rurale et radio-club.

.../...

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Des mesures générales de subvention d'une partie de l'attelage et de bonification du taux d'intérêt des prêts de la CNCA aux paysans devront être instituées au niveau de tous les projets afin que les agriculteurs ne soient pas exposés à des endettements qui les obligeraient à abandonner l'opération. Du reste, la cultre attelée ne sera appliquée que dans les zones où celà est possible. Dans les zones où l'opération ne se prête pas encore, la petite motorisation sera envisagée à côté de petites expérimentations et démonstrations en culture attelée.

Nous pensons qu'une politique de la culture attelée ainsi définie et appliquée permettrait d'obtenir des résultats plus satisfaisants./-

Table 2: Organigram of Project Management

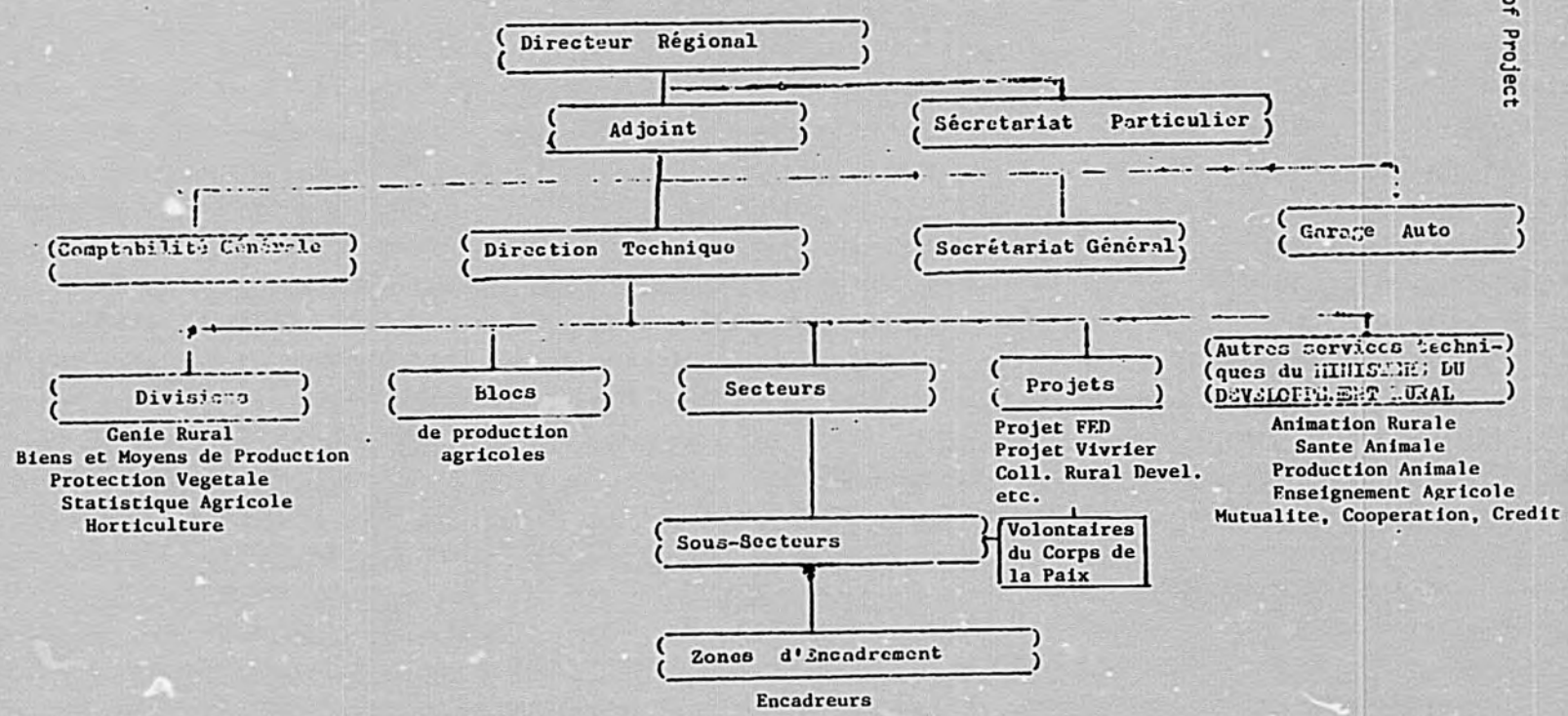
ANNEX FIVE

INSTITUTIONAL ANALYSIS

ORGANIGRAMME

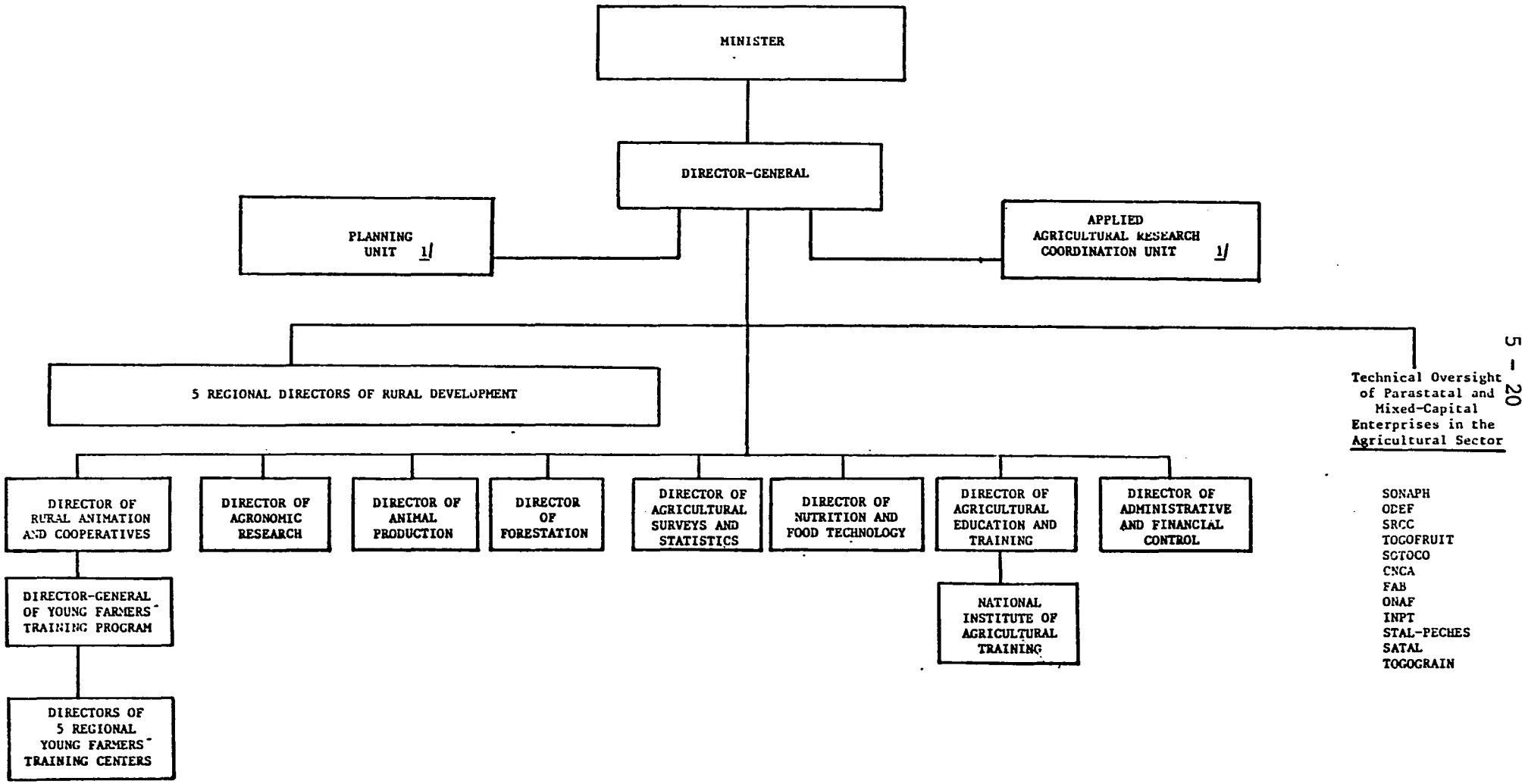
DIRECTION REGIONALE DU DEVELOPPEMENT RURAL

REGIONS DE LA KARA ET DES SAVANES



REPUBLIC OF TOGO

MINISTRY OF RURAL DEVELOPMENT



1/ To be established early in CY 1983 with World Bank technical assistance.

February 16, 1982

ANNEX SIX

POLICY ANALYSIS
6 - 1

Gordon W. Evans
Director
REDSO/WA
Abidjan
Ivory Coast

Dear Gordon:

Thank you for sending us a copy of An Assessment of Animal Traction in Francophone West Africa. It is a substantive contribution to understanding animal traction in the region, and REDSO/WA is to be commended for its foresight in commissioning this study.

Our comments are limited to the implications of the report for project design. The most striking finding of the report is that there are almost no animal traction "packages" of technology where the impact on the farming system, as opposed to one or two enterprises, is known, or has even been explored. A related finding, equally disturbing, is that many animal traction packages are not adapted to the on-farm economic situation. Four telling examples from the report are the following:

1) Technology for heavy plowing and yield-increasing "intensification", used by farmers only for expansion of hectarage, with yields constant.

2) Inadequate appropriate biochemical technology to be used in the heavy-plowing, "intensification" package mentioned in (1).

3) Farmers' obligatory purchase of inputs whose benefits do not justify their costs. (The report mentions seeders, as well as oxen traction in lighter soils where donkey traction would do).

4) Inclusion of weeding equipment in the technical package, when farmers can not weed mechanically because they do not plant in rows. (Here the report overlooks reasons for the interference of row planting with intercropping).

Since the report's major conclusion is that most animal traction packages in Francophone West Africa are poorly adapted to on-farm conditions, the implications are clear: Project design should concentrate first on development of well-adapted technical packages involving animal traction, to be followed by strengthened supporting services.

Thank you again for sharing this study with us. We hope that it will receive the widest circulation among donors involved with animal traction in West Africa.

Sincerely,

John

John W. Koehring
AAA/AFR/DR

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ANNEX SEVEN

TRAINING PLAN

TABLE OF CONTENTS

Project Manager Training

Training of Middle-Level Agricultural Field Staff

Encadreur Training

Farmer Training

Special Training Topics
- Animal Traction Equipment Repair
- Veterinary Services
- Credit

Audio-Visual Materials
- Collection
- Production

Radio Support

Appendix 1: An Inventory of Animal Traction Related Training in Existing Projects and Agencies;

Appendix 2: Problems Noted with Existing Training Programs

PROJECT MANAGER TRAINING

The current AID Project Director has general agricultural training from the University of Benin. He has had no management training, but like many young promising cadres has been thrust into a management position. While most training under the project should take place in-country, this higher level management training is not available in-country. The Francophone management program with solid financial training as well is offered at the Centre d'Etudes Financieres et Bancaires (CEFEB) in Paris, with a subsequent auxillary training program for rural development project directors in Montpellier, France. Due to his importance for the project, the Project Director should stay away no more than the nine months duration of the CEFEB course. This precludes an English language learning program and study at an American institution. A waiver must be sought for training in France.

An alternative management training program would be that conducted by the University of Pittsburgh, either in Pittsburgh or in Ouagadougou. The disadvantage, however, is the course length, only a few weeks. The project director's responsibilities demand a solid training program lasting several months.

While final arrangements had not been made at the time of the design team's visit, it is believed that funding for the CEFEB training will be made available by the GOT. AID, under the TAT project will finance tuition, room, and board costs (about $10,000) for the rural development project management course at Montpellier. All transportation costs are to be borne by the GOT.

TRAINING OF MIDDLE-LEVEL AGRICULTURAL FIELD STAFF

Middle-level field staff are defined as Togolese rural development officials who have the rank of sector chief or sub-sector chief. In number, there are 6 sector chiefs and 15 sub-sector chiefs for the Kara region; and a few less for the Savanes region. In the past, this level of staff has been peripheral to the animal traction extension effort. Generally, their past training and experience has not given them the skills needed to provide even minimum technical supervision to village extension workers.

An unfortunate situation has arisen in that encadreurs have been trained in animal traction techniques while their supervisors have not. Besides preventing the middle-level staff from carrying out their technical oversight duties, this has placed them in an embarassing professional position, which, in turn, has probably made them reluctant to participate or lend support to draft animal programs. The TAT project aims to remove this constraint to the effectiveness of extension supervision through training and the assignment of PCV animal traction volunteers as counterparts

Middle-level staff of the DRDR field services will be trained at Agbassa and Tantiegou during annual two-week refresher sessions. Sector chiefs and sub-sector chiefs may be grouped together for this training without problems arising from difference of rank. The PCVs assigned on a one-to-one basis to the sector and sub-sector chiefs will go through the training with them. Training will be given by the Agbassa and Tantiegou staffs, composed of Center Director, Training Director, PCV Animal Traction Trainers and supplementary inputs from livestock, crops, equipment, and credit specialists. The training curriculum will be the same hands-on

training as for encadreurs, whereby the Sector chiefs will also be required to get behind animals and perform field operations. In addition, the curriculum will include instruction in the following skills that extension supervisors need: agricultural record keeping; management of agricultural support centers: extension programming; and, monitoring and evaluation of encadreurs. Training will take place during the dry season at the residential training centers available in Agbassa and Tantiegou.

ENCADREUR TRAINING

Primary emphasis will be placed on encadreurs (village extension workers) within the general training program. They constitute the personnel category with highest training need and the highest potential multiplier effect.

The first training element will consist of an 8-week session, offered twice a year (Nov. - Dec. and Feb. - March) at Agbassa for the Kara Region and at Tantiegou for the Savanes Region. This training in animal traction will be offered to 10 trainees at a time who will be selected by the DRDR among present or future encadreurs. With two training sessions a year for five years, the number of encadreurs to be trained will be 20 x 5 or 100 per region. Eight-week training periods should help to counter the present criticism that 3-6 week encadreur training sessions are insufficient.

Trainers will be staff from the DRDR, AID project personnel including contract advisors and PCVs, plus training staff from organizations in the regions that have similar interests and competencies, such as the Regional Cooperative Training Center and INADES-Formation.[1]

Instruction will include a minimum of theory. Existing curricular materials will be collected, explained in detail, and disseminated for the encadreurs' library. Modest new materials will be produced and distributed as instructional aids. The bulk of the instruction will be hands-on field applications of all phases of animal traction operations and related skills.

The two centers at Agbassa and Tantiegou will contain all types of animal traction equipment and accessories that are in the present package. The center's herd will contain animals at various stages of training, so that untrained oxen are always available for practice. Principles and practices of elementary animal health will be demonstrated at the centers. Special sessions giving pointers concerning communication strategies with farmers will be given. Discussions on credit will be held with AID project staff and CNCA.

The second training element for encadreurs will consist of recyclage in the form of one-day focused learning sessions on a theme that is one, of timely interest and two, complex or problematic enough to warrant special attention. Each encadreur should participate in 4-8 refresher days per year. They will be held in a number of locations, depending upon the theme, the expertise required or the location of participants. Potential locations for the one-day training sessions include the Agbassa and Tantiegou training centers, the Centres d'Appui Technique (CAT's), and the Regional Cooperative Training Center. Again, DRDR and AID project staff, with

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[1] Job descriptions for the PCV animal traction volunteers are given in Annex Twelve.

collaboration from the other agencies, will administer the training.

The third element of encadreur training is INADES correspondence courses. These courses are currently being taken by both AID and FED encadreurs and are proving a very useful adjunct to a primarily animal traction focus. Encadreurs lack the basic principles of agricultural production without which any specialization makes little sense. The INADES staff during their accompanying face-to-face sessions and follow-up will be exhorted to introduce appropriate specificity or complementary information to make the general and widely applicable booklets more relevant. In addition, INADES will be exhorted to bring up at length with encadreurs the "why" of suggested farming techniques.[1]

The existing INADES correspondance courses are geared to a very general West African audience. Part of the job of the Technical Assistance Team, PROPTA, and other project training staffs will be to prepare complementary materials which render the courses more accurate and useful for field personnel. Optimally, INADES personnel will cooperate in this undertaking.

The fourth training element for encadreurs will be a subscription to AGRIPROMO. the INADES publication designed specifically for extension agents. It contains diagrams, interviews, suggestions, cartoon instructions and indepth articles in layman's French concerning a different agricultural theme in each issue.[1]

The fifth training element for encadreurs will be a few experimental radio broadcasts on animal traction themes. Encadreurs will be encouraged to suggest themes for the radio programs, based on problems they have met in extension, or general problems encadreurs face.

FARMER TRAINING

Initial farmer training will take place at non-residential rural centers called CAT's (Centres d'Appui Technique). In the past, farmer training has been given at Agbassa in the Kara region, but the effort will be made in the proposed project to organize training in decentralized centers nearer to the farmers' homes. CATs (5 in the Kara region and 5 in the Savanes region) constitute outreach facilities within walking distance (up to 10km) from farmers' homes. The CATs represent a logical place in which to plan animal traction training activities because they constitute the "drop off" point for cattle that have been purchased.

Staff to work at the CAT's for the purpose of farmer training will include one encadreur, one PCV, and one ox trainer. The PCV will be one of the animal traction resource workers assigned on a one-to-one basis to a sector or sub-sector chief. The encadreur will have had at least two months training at Agbassa, or the equivalent, plus some refresher training.

Selection of farmers to participate in the animal traction training will be made by DRDR and its encadreurs, as is customary. The selection process includes consideration of the following questions: does the farmer have enough land? is adequate family labor available? does it appear that the financial implications of animal traction are understood?

The first task in the training program will be to make the farmers feel comfortable with animals. Experience has shown that three days are necessary for this preliminary training. Next, animal equipment must be introduced. After the implements

[1] The TAT project will fund the INADES materials for approximately 40 encadreurs, 20 in each region. Other donor-funded projects and the two DRDR's already provide these materials to their entension staff.

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have been presented, handled, and discussed, then the farmers must be shown how to adjust the parts and must learn to use the equipment behind a pair of oxen. The farmers will be introduced to field operations by making the oxen drag a log around, and eventually a cart. Introduction to equipment and basic field operations will take another 3 or 4 days.

A second consecutive week must be spent with the following training curriculum: animal health; animal shelter; credit; and practice in plowing, ridging, harrowing, and weeding. The animal health component will concentrate on basic principles, on recognizing diseases, and on simple curative actions such as the proper way to remove ticks by hand. Animal shelter practices demonstrated will include shelter construction, shelter sanitation, and provision of water and fodder. The CAT would contain both trained and untrained oxen for practice during the two-week initial training period. Farmers will not work with the same pair of oxen every day, for they must learn about the different personalities or mentalites each different pair will manifest.

The average number of farmers to be accommodated in any two-week training session will be five. They will walk or ride bicycles on a daily basis to and from the CAT. The training will take place in the dry season, from December to April. One or two training sessions will be held each dry season.

At the termination of the training, farmers will drive their pair of work animals to the farm. A project vehicle will deliver the draft equipment. During the first year each farmer will be visited by an encadreur no less frquently than every two days. One encadreur can realistically follow no more than 3 farmers who are beginners in the use of animal traction. In addition to the 3 animal traction farmers, the encadreur will continue to follow closely the farming techniques of approximately 10 other farmers who may or may not have draft animals. While encadreurs will increase the proportion of their time devoted to animal traction work, the project extension focus is on the introduction of a new power source and implements which must be adjusted to individual farm management practices. To become skilled in the extension of draft animal techniques encadreurs will have to become better farm management advisors. An encadreur who concentrates only on animals and equipment will be a poor, and probably unsuccessful, promoter of the new technology.

Farmers attempting to practice animal traction techniques, even when closely supervised, will commit errors. In order to assure that correct techniques are practiced, and in order to expand the farmer's use of animal traction, such as by learning weeding, the farmers will attend 1-2 day refresher courses (recyclage) at the CATs every year, if it is judged necessary. This group instruction will be adopted when individual routine visits by encadreurs prove insufficient.

In order to achieve an even greater multiplier effect than can be achieved by encadreurs alone, the farmers who have mastered animal traction and who demonstrate a willingness and capability to become trainers will be encouraged to play the role of animal trainers for farmers in their areas. In Benin, Upper Volta, Ghana and elsewhere in West Africa, experience has shown that some farmers will develop a part-time business in animal training for their localities. This is the objective towards which the project will work.

SPECIAL TRAINING TOPICS

Three other areas where training will be organized to support project objectives are the following: animal traction equipment repair; veterinary services; and credit.

Animal Traction Equipment Repair

Equipment repair involves blacksmith and, to a certain degree, carpentry skills (for yokes). The problem is mainly the necessity of replacing plowshare shoes, points and small axles that wear out nearly every year. To this end, existing blacksmiths working in the project area will be identified. If they have not yet acquired skills needed to repair or replace plow parts, they will be brought to one of four centers, depending upon proximity to their home, to learn how the blacksmithing work is accomplished. Two centers are part of the proposed project, Agbassa and Tantiegou. The other two are an existing project center, Project North-Togoand an equipment manufacturing unit, UPROMA.

Veterinary Services

The provision and training of veterinary agents and assistants are the responsibility of the Ministry of Animal Production. The experience gained during the recent AID animal traction project, however, shows that PCVs assigned to the project devote considerable time to animal health care.

Beyond equipment, veterinary supply vehicle, and fuel deficiencies, there seem to be several problems related to training. First, the care of draft animals kept at the farmstead requires that the primary contact agent, the encadreur, be capable of explaining and demonstrating simple animal care, e.g., treating cuts and sores, deticking, maintaining a clean animal shelter, gauging animal food and water requirements under different work conditions, etc. To date this instructional element has been only lightly developed. Secondly, veterinary assistants and veterinarians whose work has largely been confined to national vaccination campaigns and emergency intervention at the farm level, have not worked sufficiently with draft animals to develop good diagnostic skills for animal conditions under work stress. Thirdly, due in large measure to the material difficulties already cited, animal health staff have not developed programming and monitoring skills needed to ensure systematic maintenance of draft animal health.

Given the responsibility of the TAT project for the national supply of draft animals and the DRDR animal traction extension efforts in La Kara and Savanes regions, many material impediments to improved health care will be reduced. The project will also make a concerted effort to upgrade encadreur, sector and sub-sector extension supervisor, and veterinary staff skills in draft animal health topics.

For the extension staff at all levels, training will be aimed at simple sanitation and health care that must be carried out by farmers. In addition, they will learn to avoid certain dangerous practices, e.g. the use of household lindane-based sprays by farmers to de-tick their animals. One of the early roles of the PCV animal traction trainers will be to prepare instructional materials for this level of health care intervention. The second key element at this level of training will be the use of the animal health card system envisaged in the TAT project. (See Annex 3) As the card will play a central role in the livestock insurance, credit, and veterinary programs, field staff will have to fully understand and be able to explain the system to farmers. Once again training materials will need to be developed for use in courses at the Agbassa and Tantiegou Centers.

For training needs at the veterinary assistant and veterinary level, TAT will depend principally on the development of increased professional capacity through the much more frequent contact with draft animals that will occur under the health card system working through the training cell to be created by PROPTA. The TAT livestock

specialist will contact other donor-assisted and GOT projects to coordinate the development of draft animal health training materials and methods for use in one day technical seminars with the Animal Health service's technicians at Tantiegou, Agbassa, and other convenient sites. Special two-day sessions at training centers or regional animal health headquarters will probably be needed to introduce technical, programming, and logistic requirements for the health card system.

Credit

The project role in credit related training will be minimal. Credit policy and practices will continue to be part of encadreur and farmer training and will appear also in the new curriculum for cadres. There will not be project credit agents per se. Credit will be organized through the CNCA. An additional project contribution will consist of advising the PROPTA management in the adoption of a standardized credit policy, including uniform training materials and methods.

AUDIO-VISUAL MATERIALS

Animal traction training programs must be carried out with a greatly improved set of accompanying print and non-print support documents. Extension libraries will be developed and housed in the office of the training director in both Dapaon and Kara DRDR. They will be available in several sets and can be borrowed by projects.

An example of recent audio-visual aid to be procured is the filmstrip/slide series with accompanying cassette tape and photographic storyboard entitled La Traction Animale en Haute Volta produced by FAO. Although the setting is Voltaic rather than Togolese, and although some of the concepts need to be much more carefully explained to viewers, the module is essentially appropriate. The current project will be active in assembling a number of such existing audio-visual instructional materials. Its production cost will be modest.

Table 1. Example of Cost of the Animal Traction Module

Filmstrip or set of slides	$ 8.00
Photographic text (storyboard)	1.00
Cassette tap commentary	12.00
	$ 21.00

To be ordered from Distribution and Sales Department FAO, Rome, 10 of the above modules, with slides probably rather than filmstrip, depending on existing projection equipment, should be purchased.

Production

The project will include a modest capacity to produce audio-visual support

materials. The GOT will request that a Peace Corps Volunteer with training and experience in graphic arts and audio-visual communications be assigned to PROPTA in 1984. The long lead time is suggested to permit PROPTA to establish its training agenda and procedures and to enable Peace Corps time to carry out specialist recruitment. A recommended scope of work for this volunteer is included in Annex 12.

The audio-visual materials would be produced by PROPTA. They would be part of a national collection available to projects, government services, and the DRDR training directors in all five economic regions of Togo. Examples would be photographs, posters, slides, simple diagrams, brochures with the purpose of offering clear, simple explanations to farmers and extension workers of animal traction techniques and related systems (credit). The PCV/communications specialist would work closely with subject matter specialists (veterinarians, CNCA credit agents, agricultural machinery experts, etc.) to receive the most accurate and up-to-date information to be put into cheap and durable audio-visual packages.

RADIO SUPPORT

The project will include an innovative extension component which consists of modest rural radio programming and transmission. The idea was first discussed with the Director of Cabinet in the Ministry of Information who enthusiastically endorsed the idea. Then the idea was presented to the director of the state-run regional radio station in Kara and with the regional rural development directors where it was also applauded.

Radio-Kara broadcasts from a 50KW transmitter over FM in Kara and over medium and short wave elsewhere. The signal can be heard all over Togo and into neighboring countries. Broadcasts are in French, Ewe, and Kabiye. Currently, the broadcasting schedule is the following: 05.30-08.30; 12.00-14.30; 16.30-23.00 or ten hours a day. The programs consist of news, personal or official communications, and a literary program. There is absolutely no programming devoted to development or to the rural population in particular.

The director of Radio-Kara would like to launch a weekly program for rural listeners. One journalist has already been sent to the two-year training center in Ouagadougou, CIERO, that trains technicians in rural radio programming and broadcasting. The journalist has returned and is free to be assigned as liaison with technical services, such as animal traction projects, to co-produce radio programs.

Rural radio has been active for over 20 years in many West African countries, particularly Ghana (farm forums), Niger (radio clubs), and Upper Volta (rural radio). Radio is used to transmit timely information to farmers and extension workers; such as the dates of an up-coming vaccination campaign, or marketing instructions and price information for food crops, etc. Radio is used to explain to farmers in their own language the credit system and how it works, how to recognize certain animal diseases, how to give farm animals proper nutrition, etc. The radio can be used for information transfer/training purposes to supplement an extension system.

World Bank figures place Togo at the top of the list of West African countries concerning the degree of transistor radio ownership and listenership. With the existing infrastructure, and a regional broadcasting staff trained and excited about collaboration with the animal traction project as its inroad into development related programming, the possibilities of radio support to the project are particularly promising.

One of the key problems in starting, and continuing, rural radio extension is the creation of a strong link between rural technicians and the radio programmers. Even when the technicians realize the value of the communication tool and programmers are enthusiastic, there needs to be a strong point of coordination to ensure good information exchange and follow-up. As PROPTA will have country-wide responsibility for coordinating animal traction extension and training materials, it is strongly recommended that PROPTA's national director designate one individual from the PROPTA-North office in Kara to see to it that project and Radio-Kara staff interact to produce radio programs.

Early programs may be timely 90-second spots, such as a series concerning input availability, planting dates, other field operations, and vaccination campaigns, or they may constitute an 8-10 minute explanation on credit package components and conditions. Eventually, a program of weekly themes should be developed. Some external assistance may be needed to elaborate a full rural radio program, but as such programming will serve a much larger audience than animal traction farmers alone, it is recommended that such costs be borne by the GOT.

APPENDIX 1

AN INVENTORY OF

ANIMAL TRACTION RELATED TRAINING IN EXISTING PROJECTS AND AGENCIES

IN TOGO

Many various agencies and projects are active in animal traction training in Togo. Before planning its own training program, AID made an inventory of the current animal traction training programs relative to four features:

- extension and farmer training
- equipment
- animal care
- credit

This appendix is a description of those training programs concerning animal traction carried out by 7 agencies, by 6 projects and by one institution.

DESCRIPTION OF EXISTING TRAINING PROGRAMS

1. Agency: DRDR (Rural Development Regional Office) - Kara

(Training personnel at DRDR, Kara were absent during the design effort and information similar to that collected concerning DRDR, Dapaon, especially the figures and locations of encadreurs and cadres, could not be obtained.)

2. Agency: DRDR (Rural Development Regional Office) Dapaon

Extension and Farmer Training

- four organizations collaborate in encadreur training: DRDR, INADES, FED, and the Regional Cooperative Training Center;
- training is planned by the DRDR Training Division, composed of a director, a training chief, a cooperatives chief and an extension chief;
- the hierarchy of cadres and encadreurs to be trained is the following:

Function	Location	Number	
-Sector Chief	Dapaon	1	2
	Mango	1	
-Agriculture Agency Chief	Dapaon	3	5
	Mango	2	
-Sub-sector Chief	Dapaon	9	13
	Mango	4	
-Encadreurs	Dapaon	54	79
	Mango	25	
			99

- sub-sector chiefs and encadreurs take same training courses, which are monthly one-half day sessions, held on different days in each of the five agricultural agencies (agence agricole , a category which is special in Dapaon and does not exist in other DRDRs);
- farmers are taught in one village location where they assemble, not on individual farms;

Equipment

- encadreurs are instructed in animal traction in five CATs, Toaga, Tantiegou, Barkoissi, Sardori, Gando. For the moment, animal traction trainers staff only two of these demonstration centers. Barkoissi (3), and Tantiegou (2).
- most encadreurs now have learned how to handle draft animal equipment;
- DRDR has no spare part repair or maintenance capability at present: new parts are ordered when necessary;
- it is DRDR's intention to promote the formation of a blacksmiths' cooperative at Tantiegou.

Animal Health

- the animal health section of DRDR Production Division, in collaboration with a technical agent from the livestock service, takes care of DRDR animals;

- no animal health training takes place;
- a few animal health encadreurs help to care for animals of farmers under DRDP supervision.

Credit

- DRDR presents farmers' dossiers to CNCA, because farmers are well known to DRDP;
- DRDR and INADES train encadreurs in credit; CNCA does not do any training.

3. Agency: INADES-FORMATION (African Training Institute for Economic and Social Development) - Dapaon
Status: Foreign PVO, headquartered in Abidjan and recognized by the AID Committee on PVO's

General Information

- Personnel:

Discipline	Training
Ag. Engineer	Toulouse
Ag. Engineer	Strasbourg
Ag. Engineer	Yaounde
Assistant Ag. Engineer (French)	Bourdeaux
Ag. Economist	Paris
Agronomist	Tove and France
Trainer	CESAO

- IF (INADES - Formation) responds to requests from public and private agencies in the domain of farmer and extension agent training;
- IF insists that organizations requesting its services first define for themselves the pedagogical objectives of the training desired;
- IF trains through a series of correspondence courses; it organizes face-to-face sessions on different themes; it conducts follow-up (suivi) in the field; IF has performed this type of training at the request of DRDR's, the Regional Cooperative Training Center, the Ministry of Social Affairs, Young Christian Farmers Association, etc.
- IF has analyzed the existing training programs of agencies (Projet Vivrier and Social Affairs) and has recommended changes in their training programs;
- IF has conducted program evaluations, such as for cooperatives;
- IF method of sensitization includes problem definition with farmers, explanations of "why" to farmers, and convincing farmers of the utility of certain practices, such as animal traction;
- IF does not offer "hands-on" training; nor does it have demonstration fields;
- IF tests learning acquisition during its correspondence course series by tests and follow-up after each 3-4 booklets;
- IF teaches encadreurs how to communicate effectively with farmers;
- currently IF has been asked by FED, Dapaon and the animal traction AID among others to provide correspondence courses to all their encadreurs. The cost is 50,000 CFA per encadreur per series (9 booklets, generally studied over one year), and includes two follow-up sessions.
- IF sometimes engages in signed contracts to provide services, such as it has with DRDR, Centrale; IF also sometimes furnishes services under informal, oral arrangements (DRDR, Savanes for example).
- IF headquarters in Togo is scheduled to move to Atakpame in the next year or two; a branch office, however, should remain in Dapaon.

4. Agency : Regional Center for Cooperative Training (Dapaon)

External Assistance : FAC (buildings)

Beginning Date : 1981

GOT Sponsorship : Rural Development Ministry

General Information

- Center purpose is primarily to promote cooperatives in the Savanes Region;
- Center currently working with 34 pre-cooperatives and 2 cooperatives;
- Center personnel:

1 Ag. Engineer	(Togolese)	Director
1 Ag. Engineer	(Zairian)	Sociologist/Trainer
1 Assistant Ag. Eng.	(FAC)	Trainer
1 Credit Advisor	(PCV)	Trainer

- Center training activities are financed by ILO when trainees are cooperative members;
- Otherwise, center is available for training activities at following rates: (May 1982)

Dormitory	650 CFA per person per night
Classroom	800 CFA per person per night
Kitchen Equipment	500 CFA per day

- Center includes 3 classrooms; 2 domitories with 35 beds total; modern toilet and shower facilities;
- Center calls on other organizations (SOTOCO, CESAO, DRDR, FED, INADES) to supplement its own training staff.

Extension and Farmer Training

- Center Training staff uses method of training by objectives and sub-objectives. For encadreur training, for example, encadreur's tasks (extension, credit, etc.) are broken down into sub-tasks and a training plan established;
- Animal Production Service organizes training sessions at the Center;
- the pre-cooperatives monitored by the Center appear already to have been sensitized concerning animal traction;
- in Nov. 1982, CESAO will run in the center a 3-week training course for encadreur trainers (mainly sector and subsector chiefs).

Equipment

- Center monitors 1 blacksmiths' cooperative (at entrance to Dapaon);
- Center monitors one carpenters' pre-cooperative.

Animal Care

- Center itself has not organized any animal health training.

Credit

- Center sensitizes cooperatives to the importance of savings;
- Center represents cooperatives in discussions with credit lending institutions (CNCA, FED, etc.);
- Center establishes loan conditions, repayment amounts, etc. for pre-cooperatives and cooperatives (lending institutions often prefer a cooperative rather than an individual due to the collective guarantee feature of a cooperative).

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5. Agency : SOTOCO (Togolese Cotton Parastatal)

External Assistance : World Bank

Beginning Date : 1980

GOT Sponsorship : Ministry of Rural Development

SOTOCO personnel visited : Atakpame national headquarters, Kara regional office

NATIONAL HEADQUARTERS

Extension and Farmer Training

- Encadreurs selected by written competitive examination held annually to screen for general writing and calculating skills including surface area determination, seed rates, fertilizer doses, etc. They then pass through an intensive training period for one week before being assigned to work with a sector or subsector agent. In-service are refresher courses on precise extension messages are given throughout the year. There are thirty-four extension activities adapted to different agricultural zones which make up the basic curriculum for the program of continuous training (Formation Permanente).
- Encadreurs are expected to pass information gained in training to farmers. Each encadreur keeps a folio-sized notebook (Cahier de l'Encadreur) in which family composition, crop and livestock occupation of the farm, food crop production, and all cotton crop operations are recorded on an annual basis, as well as a running account of input provision and credit reimbursement. After the end of the buying campaign in March and April the national training, extension and evaluation takes a 5% sample of the cahiers which are analyzed by computer (now at Montpellier, France but in the SOTOCO II project the data analysis capacity may be created in Atakpame) to compare actual performance with that projected earlier. Where shortfalls occur which can be diagnosed as due to extension difficulties, special training follow-up for the next growing season is programmed.
- Throughout the national, regional, zone, sector, subsector and village encadreur hierarchy, annual bonuses are awarded on review of performance records.
- There is an officer for training at each regional office.
- SOTOCO has a national director for animal traction and is placing animal traction officers at each regional office. In four regions 18 mobile animal traction demonstration teams have been working to sensitize cotton growers to animal traction (11 in Savanes, 2 in Kara, 5 in Centrale, and 4 in Plateaux).
- In cooperation with PRODEBO, SOTOCO produced a 100-page training manual/handbook for animal traction (Memento de la Culture Attelee) which is used by SOTOCO and several other projects.

Equipment

- No special training, beyond the assembly and maintenance instructions in the handbook, is given in equipment repair or spare parts fabrication for blacksmiths.

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Animal Care

- The animal traction handbook provides basic information on shelter, simple animal health care, and some disease diagnosis.
- In the upcoming SOTOCO II project, veterinarians are supposed to be hired by the parastatal to assume animal health maintenance.

Credit

- All SOTOCO encadreurs are technical supervisors for credit. They receive training in credit extension, simple bookkeeping, and credit recuperation linked to the Cahier d'Encadreur.

NORTHERN REGIONAL OFFICE

Extension and Farmer Training

- 5 SOTOCO encadreurs were trained for 3 weeks by the FED project;
- 2 of the 5 encadreurs supervised a group of farmers to whom two pairs of oxen were left for demonstration purposes. One farmer bought 1 pair of oxen and equipment on credit (1979) and is still using the oxen (1982);
- 2 other encadreurs were converted into general agricultural extension agents;
- the 5th encadreur still works near Agbassa; he has trained two additional encadreurs and he supervises the work of four pair of oxen. His role has become essentially one of ox trainer;
- SOTOCO developed with PRODEBO a 100-page training manual for animal traction which it uses in its training programs.

Equipment

- no training undertaken.

Animal Care

- no training undertaken.
- FED animal health personnel look out for health of oxen supervised by SOTOCO encadreurs.

Credit

- no training.

6. Agency: CNCA (Caisse Nationale de Credit Agricole) - Kara General Information:

- Personnel:

Director	1
Accountants	3
Data Processing	1
Cashier	1
Clerks	2
Secretary	1
Chauffeur	2
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- Director is an "A" level ag. engineer from UB, with an additional year in France at the Centre d'Etudes Financieres et Bancaires (CFFEB);
- in each CNCA branch office, one officer is designated as "credit agent". In Kara, the Director is the credit agent. His task is to sensitize the rural population concerning credit conditions and to encourage repayments.
- CNCA has three temporary offices (Bafilo, Kante, Ketao) open one day a week (market day) and staffed either by the CNCA director or by a delegate;
- the credit agent also reaches the population by assembling, via radio announcements, 30-50 farmers from cooperatives or by cantons in a village to make a presentation about credit procedures and policies;
- farmers are afraid to come to the Kara office; an atmosphere of confidence can be created only by going to them;
- the frequency of rural visits by CNCA staff depends on the agricultural season:

Feb. - July	2-3 visits per week for the establishment of credit accounts
Aug. - Nov.	1-2 visits per month
Dec. - Jan.	1-2 visits per week during the marketing season

- in general, farmers in the Kara Region seem to understand credit policies and procedures;
- CNCA is worried, however, about the nature of credit systems put into place by projects, such as FED. First, CNCA does not know what these credit policies and practices are. Second, these projects are considered temporary. The financial institution which will necessarily take over after their disappearance is the national agency, CNCA. These projects, however, have accustomed the farmers to certain credit policies. It will be very difficult to deal with these ingrained habits.
- FED and AID projects use CNCA to transit their funds, which are kept in sight accounts.
- CNCA has not financed animal traction operations in the Kara Region. Discussions on this subject were held with Projet Vivrier, but no Projet Vivrier dossiers were brought to CNCA. As a national institution, however, following national priorities (which include animal traction), CNCA is open to financing animal traction operations.
- CNCA staff are trained at the Lome headquarters (for 2-12 months). In addition, one-half day a week, the CNCA training division at headquarters runs a training session on banking techniques. CNCA personnel also suscribe to Lome correspondence courses.

7. Agency: Regional Office of Rural Animation, Dapaon
GOT Sponsorship: Rural Development Ministry

General Information

- the Rural Animation office performs no training function; its Lome headquarters organizes some training sessions;
- the office fullfills a financial support and logistics role toward village cooperatives which need assistance; for example, the office buys aluminum roofing, iron rods, and cement for village cooperative construction and delivers them to the village.
- the office also performs a liaison role with the World Food Program, which furnishes food for use during training programs, for instance. The AID project at Agbassa has already benefitted from these food services.

8. Project : AID Animal Traction

External Assistance : AID

Beginning Date : 1980

GOT Sponsorship : Rural Development Ministry

Extension and Farmer Training

- Agbassa training personnel: Center Director, Training Director, 1 PCV, Vet from Niamtougou, 14 ox trainers;
- 1 recent training session grouped 6 encadreurs from Projet Vivrier for 8 weeks. Another assembled 18 Projet Vivrier encadreurs for 5 weeks;
- the daily training schedule is the following:

06.00-0930	Practical training
10.00-1200	Theoretical courses
16.00 1800	Practical training

- training curriculum includes SOTOCO - PRODEBO 100-page manual, brochures developed by the PCV trainer. Encadreurs learn how to handle oxen, hitch up a pair, draw a cart, perform clearing, flat plowing, and ridging operations, etc. They learn about animal nutrition and veterinary care.
- the 9 project encadreurs plus 11 DRDR (Kara) encadreurs subscribe to INADES-Formation courses. They advance at the rate of two booklets a month. The cost of the INADES course is 50,000 CFA per encadreur per series of 9 booklets; the cost included two sessions to test learning and discuss questions of timely interest to subscribing encadreurs.
- farmer training takes place during 2 week sessions, also at the Agbassa Center which houses up to 20 trainees who come from up to 50 km away (four prefectures). Practical work is much more prevalent than theory. The last three sessions have trained respectively 13, 11 and 15 trainees.

Equipment

- The Agbassa Center contains 3 blacksmiths, one iron worker, and 8 carpenters. They fulfill no training role, They are responsible for the construction and upkeep of the center and its equipment.

Animal Care

- AID and FED share the services of a vet who cares for the oxen belonging to the projects.

Credit

- The AID Project Director gives the Center Director explanations concerning the credit program in vigor. The Center Director explains it in turn to the encadreurs and farmers.
- Until recently, the project was responsible for obtaining repayments of loans. Now this has become a CNCA responsibility.

9. Project : FED (Kara)

External Assistance : FED (European Development Fund)

Beginning Date : 1976

GOT Sponsorship : Rural Development Ministry

Extension and Farmer Training

- 39 encadreurs, locally recruited with schooling level CEP through quatrieme, trained over last two years, 9 in general ag. extension, 30 in animal traction.
- of 30, 5 knew a little about animals, 25 were scared to touch an ox
- two training sessions held every two years, led by either the Belgian advisor or a French volunteer. 3-week sessic· :omposed of following schedule:

06.00-09.00	ox training
09.00-11.00	theory (set of two-page handouts on a series of themes, e.g. selecting a pair of oxen)
15.00-18.00	ox training

- no audio-visual aids were used, ag. trainers regretted this;
- periodically encadreurs are called in for a 1-day recyclage;
- each encadreur trains 50 farmers, for each of which he establishes a file;
- each group of 12 farmers elects a head farmer to represent the group in discussions with the encadreur;
- encadreurs are supervised by 9 moniteurs; they are trained on the job along with encadreurs and constitute encadreurs who have seniority.
- moniteur's job is to centralize monitoring of encadreur's effectiveness. Moniteurs are at the sub-sector chief level.
- project director has two deputies, level 'C' graduates of Tove.

Equipment

- FED mechanic has trained 1 b cksmith and 1 welder on the job;
- even though illiterate, blacksmiths and welders can be used profitable. They must be taught, however, that tempered steel parts are often necessary, for instance to repair plowshares; scrap iron, which is readily available, is inadequate.

Animal Care

- a veterinary assistant runs the AID vet clinic and is in charge of animal care for both AID and FED projects. He gives shots, distributes medicine, treats parasites, and assists in training.

Credit

- FED handles credit accounting for three organizations; DRDP, SOTOCO, and FED.
- FED has trained one accountant to keep the loan and repayment figures for 900 farmers.
- Accountant also trains encadreurs in groups of 5-6. No particular instructional materials are used, just the model tables which constitute the record keeping system.

- FED has been told that in future CNCA will be responsible for credit system, but the implications of this are unclear to FED.

10. Project : FED (Dapaon)

External Assistance : FED (European Development Fund)

Beginning Date : 1980

GOT Sponsorship : Rural Development Ministry

Extension and Farmer Training

- FED project in Dapaon includes 4 departments: Animal Traction, Training, Extension, and Civil Engineering.
- 50 encadreurs, all speaking the local language of their post, were locally recruited.
- each encadreur is responsible for 50 farmers (2,500 farmers total), he visits them on an average of twice a week on a bicycle, no more than 2 km from his home.
- 1st element of encadreur training is one week spent following the daily activities of an experienced encadreur.
- 2nd element of encadreur training is a 2-month training session at the Centre Regional de la Promotion Cooperative. Session is led by FED and includes instruction by personnel from the Regional Cooperative Center, the Regional Office of Social Affairs, and the Veterinary Service.
- 3rd element of encadreur training is a month of practical training where encadreurs make a census of their zones and meet the population.
- 4th element of encadreur training is INADES-Formation correspondence courses, to which each encadreur subscribes. Currently, 19 encadreurs are taking the general introductory course; 20 encadreurs are in their second year; and 11 encadreurs are taking third year courses.
- 5th element of encadreur training consists of one-day monthly refresher sessions in Dapaon, treating for example external medicine for animals, each theme corresponding to a particular timely problem.
- farmer training takes place in farmers' fields and in farmers' village groups, not in a training center.
- the encadreurs learn to train oxen in Tantiegou. 50-60% of the farmers supervised (2,500) know how to train oxen.
- 220 farmers were once taken to Tantiegou to observe how oxen were used for weeding (until then, farmers never used oxen for this operation).

Equipment

- encadreurs are taught how to make a rayonneur during their training. They in turn teach farmers how to make them. The project has no carpenter; farmers are used to working with wood.
- the Tantiegou Center for Oxen Training has 2 blacksmiths, two welders, and a chief mechanic. In the dry season, rural artisans are trained by this staff.

Animal Care

- Project solicited a vet from livestock service. When necessary, project pays for vet's transportation and material to be sure he delivers services to the

project beneficiaries.
- the vet trains the project's sub-sector chiefs;
- each farmer must pay for the parasite control for his oxen as a counterpart gesture.

Credit

- the Project Director and Technical Director (Coordinator) sensitize the population concerning the project's credit policy and the necessity of scheduled repayments;
- the encadreurs are taught to keep records - one for the encadreur and one for the farmer - of loans, repayments made.
- FED assists CNCA (which calculates the repayment schedule) in the recuperation process, but the policing role is CNCA's, not the projects's.

11. Project : North Togo

External Assistance : UNDP/FAO

Beginning Date : 1974

GOT Sponsorship : Planning Ministry

Extension and Farmer Training

- 3 project ox trainers trained in Bobo (3 months).
- above trainers on project staff train encadreurs (40)
- encadreurs hired from villages, level illiterate through troisieme (not hired by radio advertisement and subsequent test of literacy, but hired through cooperatives).
- encadreurs are multi-purpose, not just for animal traction;
- encadreurs' initial training consists of being apprentice to an experienced encadreur during one season (May - Nov.): training is essentially on-the-job.
- recyclage provided to encadreurs, in groups of 5-6, during dry season: 2 sessions of 2-3 days per year;
- no fiches techniques as curriculum, but some photos; soon may plan to use filmstrip from FAO, Ouagadougou on animal traction;
- each encadreur services 50 farm families.

Equipment

- project site includes workshop, where 10 rural artisans are trained in blacksmithing, welding, mechanics and carpentry;
- trainers are graduated students from Sokode technical lycee plus an ex-patriate;
- artisans are chosen by villagers;
- artisans work as apprentices for 18 months under contract;
- they are paid a salary, a part of which is withheld and given to the artisan at the end of his apprenticeship in the form of material to start his own workshop;
- artisans live in their homes, travel to center for the day;
- established artisans receive recyclage, advice and new material.

Animal Care

- project requested technical livestock agents from Ministry of Rural Development.

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- Ministry assigned 6 agents with Tove training;
- project had agents trained for 3 months at Avetonou, and project itself provides their recyclage;
- livestock agents train encadreurs on-the-job and sensitize villagers;
- no special curriculum or training materials;
- the encadreurs do not give shots, neither do they handle dangerous medicine;
- animal health program lacks pharmacy and laboratory.

Credit

- project staff explains project credit system orally to encadreurs;
- encadreurs explain project credit system orally to farmers;
- project staff is contemplating producing drawings to explain credit system.

12. Project : Projet Vivrier

External Assistance : Entente Fund

Beginning Date : 1981

GOT Sponsorship : Ministry of Rural Development

Extension and Farmer Training

- first 8 project encadreurs trained for 2 months, 4 at Agbassa, 4 by PRODEBO;
- 10 additional encadreurs trained by PRODEBO for 1 week;
- PRODEBO training curriculum given to team (list of topics only 2 pages);
- project has 18 encadreurs for animal traction and
  18 encadreurs for general ag. extension;
- same training curriculum also employed to train, in one week, project cadres, namely: 2 zone chiefs
  4 sub-zone chiefs
  2 ox training center directors
  1 project training director
- farmer training takes place in 2 ox training centers, where in 1-3 weeks 13+8, or 21 farmers were trained by encadreurs and project staff plus 2 PCVs;
- PC role is farmer training, animal health care, and farmer follow-up
- training curriculum for farmers includes no drawings, but practical lessons using material, and teaching how to adjust plow equipment, how to recognize animal diseases, how to feed animals properly, etc.
- continuing education takes place in half-day or one-day sessions at center or in field where project staff teach encadreurs or farmers about some specific point/problem met at that time;
- voluntary animateurs, selected by group (15-30 persons living in one village area), act as demonstration farmers. They also organize instructional sessions for farmers. Animateurs are trained on-the-job by encadreurs.

Equipment

- 1 workshop exists staffed by a blacksmith-welder and a carpenter trained by UPROMA. Artisans are villagers.
- 1 French volunteer will advise artisans and train rural artisans elsewhere in region.

Animal Care

- 2 livestock agents have been assigned to the project, however they are not always available, or they have no means of transportation at times;
- PRODEBO also sends its animal health personnel to inspect the 45 pairs of oxen used by farmers in project;
- encadreurs administer anti-parasite drugs but do not give shots.

Credit

- Credit is included in training curriculum for encadreurs and cadres at center;
- encadreurs explain project credit system orally to farmers.

13. Project : PRODEBO (Projet de Developpement et d'Elevage Bovin)
External Assistance : FED
Beginning Date : 1976
GOT Sponsorship : Rural Development Ministry

Extension and Farmer Training

- PRODEBO used to train farmers only; now, following a new national policy, it trains cadres and encadreurs as well as farmers;
- PRODEBO used to have 60 encadreurs which it trained; 45 of them have been transferred to DRDRs or other agencies such as Projet Vivrier and SOTOCO. The 15 remaining encadreurs at PRODEBO have been converted into ox trainers;
- PRODEBO runs three demonstration and training centers in Kamina, Danye and Sokode. Each is staffed by assistant agricultural engineer level personnel in agriculture, livestock and agricultural mechanics. Each also has a male nurse versed in animal health, a carpenter, two herders, and a watchman. Kamina presently has 41 oxen on a 20 hectare area;
- each center holds several 4-6 week long training sessions all year round for farmers (often from family cooperatives); encadreurs (from projects); and cadres (sector and sub-sector chiefs, assistant ag. engineers, Tove trainees). For example, the 1982 training sessions at Kamina included the following:

Session	No. and nature of trainees	Organization
1	4 cadres	Projet Vivrier
2	4 cadres	Projet Vivrier
3	13 encadreurs and 2 cadres	SOTOCO
4	7 farmers and 3 cadres	Maison Familiale
5	2 farmers	Cooperative
6	3 farmers	Cooperative
	1 French Volunteer	FAC
	2 trainees	Tove

- center training program includes animal health and feeding, animal training, introduction to and practice with animal equipment. Animal equipment that trainees learn to assemble, disassemble, adjust, and use through hands-on practice includes plow, spike tooth harrow, ridger, seeder, weeder;
- center lodging facilities are practically non-existant. Huts in neighboring villages are rented;

- training materials used include a 100-page manual of animal traction developed by PRODEBO and SOTOCO, with diagrams, text, sketches, and outlines ;
- the center carpenter produces yokes for sale;
- a second training method, rather than receiving trainees at the center, consists of going to an organization's headquarters to dispense training. An example of this is two recent training sessions at the Projet Vivrier offices where 20 cadres and 40 moniteurs were trained.

Equipment

- there is no rural artisan training.

Animal Care

- the animal health trainers in the centers teach the trainees how to recognize diseases, administer parasite control.

Credit

- no credit training takes place;
- center staff assist in presenting farmers' dossiers to CNCA.

14. National Agricultural Training Institute (INFA) at Tove

This description of the agricultural training which takes place at Tove, 115 km northwest of Lome near Kpalime, will first treat Tove as it presently exists and secondly, briefly report on Tove as it will look in 1984, having benefitted from a FED loan of approximately US Dollars 3 million.

Present Tove

Tove is the only national institution training agricultural extension agents. Its lower cycle (level "C" agents) is trained within the Centre de'Apprentissage Agricole (CAA), which enrolls annually 60 students who have finished their primary schooling. After three years, they graduate as adjoints des techniques agricoles. Their training consists of a first year of general instruction, followed by two years of specialization in agriculture animal husbandry or forestry. They also take courses in rural animation, extension practices, and simple applied mathematics and economics. The students (four out of 60 are women, on the average) reside in dormitories and receive a monthly government stipend. A minimum of five years of field work as government paid extension worker is required after graduation before being permanently accepted (upon favorable evaluation) as a civil servant. Current graduates of Tove "C" level appear to be much in demand. They staff the five new experimental agricultural centers and are assigned to regional Ministry offices as extension agents.

The upper cycle (level "B" agents are trained within the Ecole Nationale d'Agriculture (ENA) , which enrolls annually 40 students having completed their first four years of secondary school (BEPC degree). After three years, they graduate as ingenieurs adjoints. Their three years of training are broken down into year one: stages of the agricultural season (planting, weeding, etc.); year two: farm management and marketing, including two months of practical work away from the center; year three: extension practices. Approximately

one-half of the students' activities involve theory, and one-half, practice. The students manage their own cooperative. The three branches taught are agriculture, engineering, and forestry. Students live in domitories and receive a monthly government stipend of 24,000 CFA francs. Upon graduation they become staff members of regional government (MRD) offices where they often as chef de secteur or chef de sous-secteur, become supervisors to extension agents (graduating from cycle 'C' training at Tove) or work in parastatals (i.e. Togolese Cotton Company or SOTOCO) or foreign research institutes (e.g. Cotton and Textile Research Institute, IRCT, or French Coffee and Cocoa Institute, IFCC). After five years of service in the field, the graduates are evaluated and if successful are permanently accepted into the civil service. A common staff teaches at both levels of agricultural training.

Future Tove

Starting in 1982 and with FED financing, the National Institute for Agricultural Training at Tove (present site, extended and improved) will contain the following elements:

- 90 "modern farmers" will be recruited at the BEPC level and trained for two years. This group will replace the current "C" level training for 60 primary school graduates. This new training pattern will resemble the current five agricultural training centers
- 60 ingenieurs adjoints will be trained along the lines of the present "B" level stream. Animal husbandry will be added to the curriculum and construction of a workshop for farm machinery and tools is planned
- ingenieurs des travaux agricoles will be recruited after their baccalaureat and trained for 2 years
- agricultural engineers (previously trained in three years, after their baccalaureat at the University of Benin) will be trained over two years to become teachers in agricultural secondary schools
- ingenieurs adjoints will be recruited and trained over 2 years to be agricultural advisors in the primary school system.

APPENDIX 2

PROBLEMS NOTED WITH EXISTING TRAINING PROGRAMS

1. Most people agree that the national extension service is far from effective. The GOT appreciates the assistance projects have given to the improvement of extension (largely encadreur) training. Now the problem is to transfer projects' training capability into national hands.

2. A timing and programming problem arises in planning training sessions for farmers, encadreurs, and cadres, for instance at PRODEBO's Kamina center. Projects request training at the same time, to the extent that PRODEBO cannot entertain so many requests. Training is also usually requested too late in the year, just before or during the first rains, when farmers should be preparing to seed.

3. Animal traction farmers are having increased difficulties repaying their loans for equipment. And as the minutes of the May 19, 1982 COCA meeting attest, UPROMA prices have substantially increased. In addition to a desired national effort to standardize subsidy procedures, a training emphasis on how farmers should manage their family budgets appears a necessity.

4. Some training programs in animal traction appear to have no written curriculum. Even for those that do, it is difficult to perceive what training actually takes place because a curriculum consists of a list of chapter headings. Information concerning training programs should be more in evidence and be more accessible to interested parties.

5. Project training directors admit a dearth of teaching materials, especially audio-visual aids such as filmstrips, slides, diagrams, photos.

6. The fact that some farmers are much more comfortable around and proficient with oxen than encadreurs attests to the fact that encadreur training is not all that it should be.

7. Unfortunately, one level of personnel, say encadreurs, often do not want to impart the knowledge they have worked hard to acquire and which is associated with the "prestige" of their personnel category. When faced with a farmer with a problem, such as a broken plow, the encadreur has a tendency to say "tell me and I'll fix it" rather than "here's how you can fix it". Through a fear of losing prestige, some staff guard their knowledge jealously rather than sharing it.

8. The ingrained pedagogical system in evidence involves much more giving orders from one level of personnel to the next lower level than it does giving explanations. The "why" is all too often neglected in a so-called pedagogical setting.

9. Existing training cycles are often too short. There is not time to cover all the required topics and be assured that the trainees level of mastery is adequate.

10. Some people believe that trainers must be literate. There are some excellent blacksmiths who have trainer qualities despite their illiteracy.

11. The fact that some blacksmiths make plowshares out of scrap iron, which is not of sufficient quality (i.e. semi-hard steel), demonstrates the fact that an important technical fact has been ignored in a training program, or that proper materials have not been provided.

12. Judged missing from the Nor Togo project were supply depots (pharmacies) for animal drugs and laboratories in which to analyze animal diseases.

13. Projects have learned to be wary of literate but unmotivated encadreur candidates who flock to examination centers announced over the radio, score relatively well on verbal tests, but are looking only for a white-collar job.

14. There seems to be a paucity of information exchange between agencies, services with nevertheless common interests. An example is the mutual lack of understanding of CNCA and the plethora of credit systems adopted by various projects.

15. National institutions such as CNCA are justifiably worried about the future of project-oriented and led development when project funds and advisors will have left the country.

16. There appears to be a need to identify rural artisans among villagers who may already have relevant skills, such as blacksmithing or welding.

17. If a public service, such as a DRDR, desires the collaboration of an external/private agency, such as INADES-Formation, the former has the obligation to clearly define what role that outside agency is to play. In the past, some public services have neglected this responsibility.

18. The little curricular materials for animal traction (i.e., 1979 SOTOCO-PRODERO manual) which exist are out of date in that they present diagrams of equipment which is not used any more.

19. The capacity to repair spare animal traction parts appears not to be widespread. One hears very frequently that new parts can be ordered much more easily than old ones repaired.

20. The physical number of encadreurs, for instance animal health encadreurs in the Savanes Region where animal traction is quite common, is insufficient.

21. DRDRs should have a small library of training materials on animal traction; they don't.

22. Encadreurs should necessarily speak the local language of the farmers they supervise; this is not always the case.

23. In some projects, farmers may be given too much without sufficient personal counterpart contribution. The Dapaon DRDR requires that farmers pay for animal parasite control. INADES-Formation insists that correspondence course enrollees pay a token contribution: a mandatory financial gesture on the part of the farmer is a sound idea.

24. One of the reasons projects have instigated their own credit systems is evident in such criticisms as "it takes too long to go through the CNCA and farmers must order their animals a year in advance". Any attempt at rendering more viable national institutions must deal with such a situation.

25. Some projects depend on the part-time services of an extension agent, for instance a vet. The full-time secondment method would be more reliable to take care of project needs.

26. Encadreurs have played the role of gendarmes in terms of recuperating loan payments. More and more, however, they see that role as detrimental to their overall development concern and transfer that role to the professional lending agents of CNCA.

27. It is not sound training procedure to hand over to a farmer a team of animals already trained.

28. Farmers often don't use their animal traction equipment for weeding. When 220 farmers from the Savanes Region were all bused to Tantiegou, they observed the weeding operation, and many tried for themselves back on their own farms.

29. It is clear that ag. students still have a predominantly textbook education and one which does not favor local, cost-effective solutions. For example, students will speak of chemical fertilizer and will ignore the character or benefits of organic fertilizer.

ANNEX EIGHT

ENGINEERING ANALYSIS

CONSTRUCTION COST ESTIMATES

I.	KARA		$91,250
	A. Office Block	sq. m.	
	1. Director's office	24	
	2. Director's secretary	6	
	3. Asst. Director's office	20	
	4. Accounting office	36	
	5. Secretarial pool	24	
	6. Technical Assistants' office (2)	40	
	7. Conference room	25	
	8. W.C.	5	
	9. 20% wall, corridor allowance	35	
	Sub total	215 sq. m. @ $250/m	$53,750
	B. Director's House		
	150 square meters @	$250/m	$37,500
II.	AGBASSA (Animal Traction Holding/Training/Supply Center)		$ 7,400
	A. Center Director's House		
	40 square meters @	$185/m	7,400
III.	TANTIEGOU (PROPTA National Buying Center - See Plan)		$63,900
	A. Holding pastures, pens, chutes, etc.		
	1. Concrete corner posts, steel posts, barbed wire: 5,000 meters @ $6/m		$30,000
	2. 20 gates @ $50		$ 1,000
	3. Chutes, crushes, steel posts with bolted planks: 200 meters @ $20/m		$ 4,400

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B. Tantiegou Water Supply		
1. 6,000 liter water resevoir, and pumping station		$ 5,000
2. Water reticulation system		
a. 1,200 meters pipe and fittings: @ $250/m		$ 3,000
b. 10 - 1 cubic meter water troughs: @ $200		$ 2,000
C. Office Space	sq. m.	
1. Offices 2 x 20 sq. meters	40	
2. Veterinary storage	20	
3. Working storage space	20	
Subtotal	80 sq. m. @ $185/m	$14,800
D. Machinery Shed	20 sq. m. @ $185/m	$ 3,700
IV. KARA and SAVANES REGIONS (Technical Support Centers - CAT's)		$180,000
A. New Construction: 5 sites @ $30,000		$150,000
1. House 40 sq. m.: @ $185/m		$ 7,400
2. Office, warehouse, work space: 100 sq. m. @ $185/m		$ 18,500
3. Corral with shade		$ 3,300
a. 80 meters of pole and plank: @ $20/m		$ 1,600
b. Shade, shelter 50 sq. m.: @ $20/m		$ 1,000
c. Chute and ramp 15 m.: @ $20/m		$ 300
d. Water trough		$ 200
e. Feed trough		$ 200
4. Drying/Threshing floor, misc.		$ 800
Subtotal		$ 30,000
B. Renovation: 5 sites @ $6,000		$ 30,000
1. Corral		$ 3,300
2. Roof, wall, paint, etc.		$ 2,700
Subtotal		$ 6,000
TOTAL ESTIMATED CONSTRUCTION COSTS		$342,550

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ANNEX EIGHT

ENGINEERING ANALYSIS

CONSTRUCTION PROGRAM

The following are the major steps which must be taken for the correct and timely design and construction contracting of the office building, holding center and field centers in the first eighteen months of the project.

1. Upon signature of the Project Agreement, OAR/Lome will request technical and cost proposals for the provision of designs, contract documents and supervision from several proven local architectural firms. The proposals will be based upon the sizes and criteria outlined in the Engineering Analysis of the PP. REDSO/WA Engineering may be required to assist.

2. The OAR/Lome, PROPTA and REDSO/WA Engineering will review the proposals and, in consultation with the Government of Togo, select an architectural firm to provide and supervise a bid package. Selection will be based equally upon indicative designs, technical capability, past performance and cost of services.

3. The architectural firm selected will negotiate a contract with REDSO/WA Contracts and will begin work on final designs, working drawings and construction specifications. REDSO/WA Engineering will provide guidance and inspect and approve final building sites.

4. The architectural firm will present final construction drawings, specifications and contract documents in a completed bid package conforming to AID regulations to the OAR/Lome, PROPTA and REDSO/WA Engineering for approval, in consultation with the Government of Togo.

5. Upon approval, the architectural firm will advertise the bid package among local construction contractors (a waiver will be necessary to limit the procurement of these construction services which exceed $50,000 to local contractors).

6. The architectural firm will report, and the OAR/Lome, PROPTA and REDSO/WA Engineering will select a local construction contractor, based upon the cost proposals, and its proven capability in the region.

7. The construction contractor will carry out the work, supervised and controlled by the architectural firm. Periodic inspection by REDSO/WA Engineering will be linked to contract payments to verify quantity and quality of work.

8. As the construction contractor completes work on various buildings the architectural firm will organize formal inspections by OAR/Togo, PROPTA and REDSO/WA Engineering for provisional acceptance and payment.

9. A formal inspection for final acceptance and payment will be organized at about six months after the completion and provisional acceptance of the last work finished.

ANNEX EIGHT

ENGINEERING ANALYSIS

CONSTRUCTION CRITERIA

All design and construction financed by the project will conform to the following criteria:

1. Stability and Durability
   - sturdy, substantial building materials and details
   - two-bar reinforced concrete integrated corner columns and continuous bond beams
   - clean, graded aggregates
   - correct concrete mixtures and curing
   - heavy-gauged aluminum channeled roofing panels
   - dried and bolted wooden trusses

2. Economy and Efficiency
   - simple, straightforward design
   - minimized wall to floor space ratio
   - maximization of local building materials
   - basic screened and shuttered window openings
   - optimal construction scheduling

3. Ventilation and Cooling
   - studied building orientation
   - thermal siphoning through ceiling and gables
   - ceiling fans as necessary and feasible
   - wide roof overhangs
   - top-shuttered window openings
   - shade tree planting

4. Lighting
   - optimum ratio of window openings to exterior walls
   - skylights as necessary
   - bright interior paint

REDSO Engineering will provide assistance to ensure that the design and construction conform to these criteria.

Renovations:

Four small agricultural support centers located at Gando, Toaga, Kante and Nampoach will be renovated. Each generally consists of a 120 sq. m. building sectioned into an apartment, store-room and an 80 sq. m. warehouse. These 15-year old buildings are structurally sound and require only patching, fixtures and refinishing. An equipment shed and corral will be added to each to conform to the new field centers. An adequate supply of potable water will also be assured by the project.

The renovation of these centers and construction of equipment sheds and corrals will be initiated, supported and supervised by a Peace Corps Construction Volunteer working with the centers' staffs and local craftsmen and workers. The detailed scope of work for this volunteer is in Annex Thirteen. Recent experience with PC Construction Volunteers indicates that focused training, sets of resource materials and logistical support will be necessary.

Engineering Support:

Due to the size and composition of the OAR/Lome staff, regional engineering assistance will be required for successful implementation of this project. Bi-monthly short visits by REDSO Engineering will be required during the first year and a half of the project to carry out the construction program detailed in the Engineering Analysis and in this Annex.

Identification and Evaluation of Environmental Impacts in Impact Areas

A. LAND USE AND NATURAL RESOURCES

1. Changing the character of the land through:

   a. Increasing the population L

   b. Extracting natural resources L

   c. Land clearing ..... M

   d. Changing soil character ..... L+

2. Altering natural defenses L

3. Foreclosing important uses ..... N

4. Irreversible, inefficient commitments L

5. Building/Construction ..... U

6. Jeopardizing humans or their work ..... N

B. WATER QUALITY

1. Physical state of water L

2. Chemical and biological states L

C. ATMOSPHERIC

1. Air additives ..... N

2. Air pollution ..... N

3. Noise pollution ..... N

D. CULTURAL

1. Altering physical symbols ..... N

2. Changes of cultural traditions L

E. SOCIOECONOMIC

1. Changes in economic/employment patterns ..... L+

2. Changes in population L

3. Changes in cultural patterns L

F. HEALTH

1. Human nutrition ..... H+

2. Pesticide toxicity L

3. Water boone disease vectors ..... U

4. Zoonotic disease incidence L

LEGEND

N - No environmental impact

L - Little environmental impact

M - Moderate environmental impact

H - High environmental impact

U - Unknown environmental impact

+ - Positive impact

- - Negative impact

H. Environmental Analysis

This project has been designed to improve agricultural productivity while taking conscientious care in the northern region of Togo, throughout the design process to prevent, minimize or mitigate any environmental problems that may be asssociated with key interventions. As a result of this design strategy, no significant negative impacts are anticipated from the project elements that are adequately enough defined to evaluate at this point. This is substantiated in the IEE and the three pesticide risk-benefit analyses found in Appendix 2 to this annex. The risk-benefit analyses detail the safety and precautionary measures that must be followed to ensure the efficacious use, handling, storage and disposal of the proposed chemicals. For the project elements that will be more fully defined as part of the implementation process, the IEE provides guidelines that the implementation team must use to prevent, minimize or mitigate potential environmental problems commonly associated with the given activity categories.

Those project elements which must be better defined include well development, rice production in the bottomlands of the Tamberma area,.building construction and animal grazing. An IEE must be written for the elements once they are more clearly defined and before any on-the-ground action towards them begins. Certain activities such as training, institution building and controlled applied agricultural research have been categorically excluded from environmental review due to their obvious benign impact on the physical environment.

The important issues concerning land use are detailed in Appendix 1 to this Annex and are mentioned throughout the PP text. Though this project will not fund an activity in land use inventory, planning and management, it unequivocally recognizes the importance of such an activity to the long term success of agricultural production and animal traction in Togo and to sustainable development itself. Thus, the project has identified potential sources and means for addressing this need. With assistance from REDSO/WA, OAR/Lome will issue requests to the S&T Bureau to mount an appropriate land use inventory, planning and management activity, from one or more of the central projects identified in Appendix 1. Such a parallel activity would significantly complement the proposed Animal Traction Development Project, and provide an extremely valuable tool for major land based development activities in Togo. The REDSO/WA Natural Resources Advisor would be the key point of contact and continuity throughout the life of the parallel activity.

Finally, an additional measure that will better ensure the maintenance or improvement of environmental quality in the project zone is the inclusion of environmental expertise in the series of evaluations proposed for the project.

ANNEX NINE: ENVIRONMENTAL ANALYSIS

APPENDIX 3: INITIAL ENVIRONMENTAL EXAMINATION

Project Description

The Togo Animal Traction Project is a 5½ year initiative, budgeted for $4,990,000, designed primarily to increase the agricultural production and incomes of Togolese smallholder farmers in the Kara and Savanes regions. The key tasks of the project are to strengthen the newly created National Animal Traction Program (PROPTA) in its ability to deliver services in the areas of animal supply, training, credit and monitoring, and to create Extension Support Centers (CAT's) in the two regions to work with farmers and pastoralists in animal traction. The basic project activities are to:

(1) develop a national system for the acquisition and delivery of work animals;

(2) develop training courses in animal traction for field staff, and administer those courses to AID-TAT extension staff;

(3) develop methodologies for monitoring and evaluating animal traction projects;

(4) standardize and coordinate the administration of medium-term animal traction credit programs with the National Agricultural Credit Bank (CNCA);

(5) establish 10 extension support centers (CAT's) and train the staff to run them;

(6) introduce 500 farmers to the use of animal traction;

(7) create two pilot herds to study possibilities for the improvement of extension livestock production practices;

(8) conduct a program of applied research of cropping packages and farming systems using animal traction;

(9) establish an operative monitoring and evaluation unit to asssess the viability of project and certain other related activities;

(10) develop wells and construct buildings to support the above listed activities.

Description of Possible Impacts

A. Land Use and Natural Resources

1. Changing the character of the land through:

a. Increasing the population of people or animals in the project: The project will likely provoke a small increase in the human population and a moderate increase in the animal population in the project area. In the short term, people may be attracted to the area in order to take advantage of the benefits made available through the project. Over the long term, the project may provoke increased human well-being, resulting in longer life and decreased infant mortality among farmer-families in the area. The effect could be higher population growth rates. The number of domestic animals will increasee when animals for traction are purchased for use in the project.

With additional human and animal life, the demand for increased life support structures increases. The increase in human demand will not be great enough early on in the project, as to create any immediate concern for addditional requirements for domestic water, waste disposal, roads, energy, and sanitation. It is expected that the proposed parallel activity in land use planning will be able to address this issue before any increased human pressure becomes serious. Concerning animal life, the project makes provisions for establishing an appropriate grazing plan and animal nutrition program to keep livestock in balance with available vegetation and thus prevent overgrazing and range/grassland degradation. A livestock specialist, with experience in range management is to be a member of the T.A. team. He/She will participate in shaping integrated farming systems (crops, livestoock, and trees) that could effectively thrive among the target beneficiaries in the project zone. Once these farming systems and the inherent range and livestock management programs are defined, they will be evaluated through the IIE process and their ecological viability will be determined. Animal numbers are to be kept at the level needed to sustain animal and vegetation productivity.

b. Extracting natural resources such as minerals or water: While non-renewable resources will not be extracted as part of the project, water, through the construction and use of wells, will. The impact of the wells and their planned use will be evaluated once the specific sites for them have been confirmed, and their construction plans defined. This is the reason for deferring this project component, as noted on the IEE facesheet even though general siting hass been suggestged. Included here are some general guidelines for planning and developing the wells in a way that prevents, minimizes and/or mitigates potential environmental problems associated with water development. Of course, primary considerations include the depth of the water table, the volume of water and recharge rates and the relationship of these factors to surface water, geologic features and precipitation around potential well sites.

If dug wells are planned, linings are recommended in order to prolong well life and to reduce contamination. The casing, or lining, should rise at least one meter above ground level. This prevents small children and animals from falling into the wells and also reduces the amount of contiminated water spilling back from the ground surface. Bore or tube wells are commonly used for domestic and agricultural water supplies, and are environmentally sound sources of water

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if soils are favorable and appropriate boring equipment is used. Such wells should be capped to prevent contamination. Driven wells, which are made by driving a well-point or pointed strainer into soft or sandy soils are also an option. The driven wells require a special pump and this may produce maintenance problems.

A problem common to all types of wells is seepage of contaminated water back into the source. The best casings cannot prevent all seepage. Thus, methods to reduce spillage and seepage are recommended. The wells should be surrounded by sloping concrete aprons with drainage furrows. Water spilled at the well will then be directed away rather than back toward the casing. Trenches of loose gravel around the edge of the apron will eliminate puddles which encourage snail or insect breeding. Layers of clay mixed with water puddled around the casing will also reduce seepage into the well. Water should be carried by conduits to troughs or holding tanks to keep livestock away from wells. Gravel around and beneath the trough and tanks eliminates standing water. People can also be encouraged to do laundry or bathe away from the well by the addition of a cement laundry or bathing pads 20-25 meters from well. Gravel drains should also be included in these areas.

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Finally, provision should be made to ensure effective maintenance of the newly constructed wells. Community support and acceptance of responsibility for the wells are crucial to both the maintainance and development of the wells. Water development projects in which villagers were elected as caretakers and have been trained in operation and/or preventive maintenance, have had great success. It is recommended that the project implementation team, including OAR/Lome, use all possible linkages with the on-going Togo Rural Water Supply Project (693-0210).

c. Land Clearing: Approximately 1,500 hectares of land will be cleared of heavy brush and trees by the project in order to expand agricultural production based on animal traction. This amount of land translates into an average of three additional hectares for each of the 500 farming families to participate in the project. The new land must be cleared to allow animial traction equipment to make regular and efficient patterns of cultivation. Rather then using motorized mechanical means such as tractors and bulldozers to assist in uprooting trees and clearing heavy brush, cable winches for stumping will be used by teams of farmers. This minimizes the removal of the already shallow layer of topsoil in the area. The negative impact of this land clearing is expected to be minimal in the context of the project. Measures have been designed into the project to mitigate the problems associated with land clearing, such as exposing infertile soils, erosion, excessive runoff and the removal of vegetative resources which provide fuel, food, fiber and other products important to rural subsistance. The trees and ground cover will not be indiscriminately eliminated, but rather conserved wherever practical and systematically planted in certain areas.

Vegatative bands between fields will be planted with indigenous species of trees which will serve as wind breaks, soil stabilizers, fuel woodlots, a source of forage for the draft animals, watershed controls and a source of construction wood.and secondary products. Wherever possible and viable, the project team will collaborate with the FAO which is implementing a forestry project which can complement certain activities in the TAT project. Finally, the parallel activity in land use planning, may provide guidance in this area on a broader regional or country-wide scale, during and beyond the life of this project.

d. Changing the character of the soil

A significant negative impact on the soil is not expected to result from the animal traction project. In fact, the character of the soil may even be improved by a plowing and primary tillage using the power of animals. The effects on soil from the proposed land clearing are not expected to be significant, given the proposed mitigative measures discussed above. Overgrazing, resulting in soil degradation is expected to be prevented by the design and institution of integrated farm systems, comprising sound range management practices.

It is expected that soil quality will be managed through the proper manipulation of the following key factors:

(1) characteristics of plowing such as type of plow, draft power source, depth of plowing, soil mositure at the time of plowing and interactions with the time of planting, texture of the plowed surface, additional tillage for seed bed preparation and time of plowing, (2) cultural techniques associated with the various crops, especially weeding, (3) incorporation of organic material by plowing and (4) the nature of the crops in the rotation, especially of the first crop following plowing. The project implementation team will play a key role in maintaining or enhancing soil quality and facilitate a spread effect through the training of extension agents in soil management and through demonstrations.

Plowing affects soil structure, the water regime, particle size distribution, sensitivity to erosion, organic matter content and microbial activity. Based on studies carried out by Charreau in 1970, it is expected that overall soil condition can be maintained or improved as a result of the proposed project activities. As for soil structure, plowing that incorporates organic matter can result in increased biological porosity (holes and galleries from the work of termites and insects). This results in increased microbial activity, such as rhizobium, improved plant nodulation and ultimately improved yields. With plowing that takes place at the end of the rainy season, hardening of the soils should not occur during the dry season, either in the plowed layers or in the underlying layers. It is expected that the soil water regime will be improved by plowing. Charreau has observed that crops withstand drought periods better when they are planted after plowing. This improvement of the water regime after plowing may be attributed to: 1) improved infiltration of water into the soil, (2) reduction of evaporation, and the conservation of water stored in the soil and (3) improved use by plants of stored soil water. Experiments carried out by Charreau in Africa indicate that plowing does not automatically increase erosion, but in fact can be a soil conserving practice, either by direct action, as on bare soil, or by indirect action through more rapid development of a plant canopy. Increase of erosion after plowing generally results from poor plowing practices against which this project is expected to work.

2. Altering some of the significant natural defenses provided by an area: The project will remove brushland and forests that currently influence the dynamics of their respective watersheds. Removal of the vegetation will effect runoff rates, stream flow, erosion patterns, sedimentation rates and wildlife compositon. While immediate effects may be negative, they can be remedied or mitigated in the near -term through the tree planting and agro-forestry activities related to this project. No other alteration of significant natural defenses is anticipated as a result of the project.

3. Foreclosing important and perhaps better uses of the land: The use of land proposed by the project is considered to be the best of possible scenarios, based on the current level of understanding about land use capability in the African savanna and of the inhabitants' need and demand demand level for land based products. More importantly, use will not be foreclosed. In fact, it is anticipated that the project will result in higher quality land use by developing currently unrealized opportunities that will provide increased and sustainable productivity of agricultural goods, without significant negative environmental impact.

Before agricultural expansion and animal traction reach a high level of intensity, the proposed parallel activity in land use inventory and planning should provide guidance to ensure that important land uses are not foreclosed by decisions made on inadequate information.

4. Irreversible or inefficient commitments of natural resources: With the significant increase in animal numbers in the project zone, concern about the destruction of ground cover and the adequancy of pasture and forage is necessary. The project, as discussed in the technical analysis, will rely on free pasturage through much of 1982/83. With greater animal numbers in future years, provision will be made for stored fodder, feed and nutrients.

The project will rely a great deal on proposed research on test grazing plots, in order to provide guidance on improved pasture management. The livestock specialist, who should be quite capable in range management, will have the responsibility of articulating range and grazing management practices that result in sustained and higher levels of vegetation and animal-production. A critical input to the early project evaluations, will be a range management specialist's evaluation of the grazing and feeding plan that will have been prepared for the project. An IEE will be written for this project element at this time. Recommendations for improvement will be made if and where necessary.

5. Building Construction: Operation centers and housing will be built under the project. Also, a few existing structures will be renovated. The approximate sits have been selected. While soils and site characteristics vary at the various locations chosen across the project area, their selections based on the general criteria of land availability, good drainage (for corral construction), road access, water availability and favorable topography. Once the detailed plans for the structures are developed or a contractor to design and build them has been identified and evaluated for its ability to carry out quality work, an IEE will be prepared for this element. A REDSO/WA engineer, or other qualified party, will make site visits to verify the acceptability of the selected locations and will evaluate the construction proposals and the bidding contracting firms. He/She can prepare the IEE for the project construction elements.

6. Jeopardizing humans or their work because either is put into a zone of potential disaster: None of the project activities are planned for areas subject to unusual harm or disaster such as flooding, earthquakes, high levels of pollutants, insects or other plagues.

B. Water Quality

1. Changing the physical state of water: Only a minimal increase in siltaton that could change the physical state of water is expected as a result of land erosion. Runoff from cleared land could be the cause of such a change. Physical changes in water usually change the chemical and biological state of water by sediments lessening the amount of light that penetrates a water body and through slowed or stopped photosynthesis. Water runoff and erosion will be mitigated by tree planting and agro-forestry activities connected to the project.

2. Changing the chemical or biological states of water: Deleterious changes in the chemical or biological states of water are not expected to result from the project. The biggest threats to water pollution in this project would stem from the misuse and poor handling of pesticides which are proposed for use in the project, and from the potential for animal wastes to be washed into a stream or enter ground or surface water supplies. This can cause excessive nutrient loss to the water supply. Measures have been designed into the project to prevent such water pollution. The measures pertaining to pesticides are described in Appendix 2 of this Annex.

As for animal wastes, an effort will be made to channel them back into the production process as fertilizer rather than be allowed to accumulate and reach unsafe levels around water points. The suggested closed water pumping systems greatly reduce contamination risks. The installation of watering troughs and cattle watering areas will contribute to minimizing water quality problems.

It is not expected that agricultural nutrients from the project will create water quality problems. Nutrients will be managed to enhance crops production and nutrient losses will be controlled through: (1) the timing of any nutrient application which can reduce leaching, (2) rotating crops which reduce the need for nutrient input, (3) refraining from unnecessary or excessive fertilization which reduces potential for nitrate leaching, (4) using animal wastes which enables a slow release of nutrients and improves soil structure, and (5) plowing under green leguminous crops which reduces the need for nitrogen fertilizer.

C. Atmospheric

1. Air Additives: The only addditive that would enter the air as a result of the project is toxaphene when sprayed on the animals in Tantiegou. Given the relatively small amount to be sprayed and the multiple precautionary measures designed into the project, the air additive and water quality impacts are expected to be quite minimal.

2. Air Pollution: The only source of air pollutants generated by the project would be the few project vehicles necessary for implementing the project. The exhaust impact is expected to be minimal to insignificant.

3. Noise Pollution: The only noticeable noise resulting from the project will come from the construction activities and vehicles. The former will be minor and short lived, and the latter minimal and dispersed.

D. Cultural: This project is not expected to destroy important physical symbols of a culture or dilute the cultural patterns that would weaken the group development

among the project participants. In fact, a key feature of this project is its intent to provide the project participants with the means to direct and control the development of their own farms. This is to be done through providing the farmer-adopters with information, skills and resources that they can use as tools in improved farm management and in strengthening the opportunity for the continued evolution of their culture.

Rather than imposing certain practices on the farmers, they will be provided with options. The farmers, through PROPTA, will be encouraged to contribute to the broader planning and decision-making process for animal traction activities in the Kara and Savanes regions.

E. Socio-economic

1. Changes in economic growth and employment: As detailed in the economic analysis of this PP, economic growth, increased employment and higher incomes are programmed results of this project. The economic and technical analyses show that land and natural resources are available to support this growth, and that the growth and returns should be able to pay for the initial investment required to catalyze it. The project level analysis shows that for the first few years following the adoption of the animal traction technology, net farmer incomes will decrease. The socio-economic impacts of the agricultural packages and the project as a whole will be monitored throughout the life of the project. Farmer income should be about 80% higher than at EOPS than when the project began. Internal rate of return is estimated at 10% over fifteen years.

2. Movement, resettlement or changes in population: Human movement and resettlement are not necessitated by the project, nor does the project indirectly or directly encourage such patterns in a significant way. Any changes in the population should result from natural growth rates, and only to a slight extent from increased

well-being, generated by the project. The proposal agricultural expansion is generally located within easy access to resident farmers and will not require any dislocation of existing settlements.

3. Changes in cultural patterns that could affect socio-economic patterns in a major way: This project will evoke changes in cultural practices that should have a gradual change on socio-economic patterns. A great deal of socio-economic data was collected and analyzed by the design team so that the project could be shaped to affect socio-economic patterns in a positive way. The Social Soundness Analysis provides details and regards the design teams efforts as potentially successful in this respect.

F. Health

1. Nutrition: Human health should be improved through the improved nutrition that is expected to result from the Togo Animal Traction Project. The composition and the quantity of the food to be produced and consumed by the farming population are the key factors.

2. Pesticides Toxicity: Potential health hazards are associated with the use of some of the proposed pesticides. In response, measures have been designed into the project to prevent or mitigate such hazards. These measures are detailed in

the Environmental Assessment for toxaphene and the risk-benefit analyses for thiram and creosote, all found in Appendix 2 to this annex.

3. Water Related Disease Sectors: The development of rice in the bottomlands of the Tamberma area could create health problems. The standing water in the bottomlands for rice production is a habitat for snails and mosquitoes which are vectors for schistosomiasis and malaria, respectively. Concerning these two water related diseases, additional information is needed on their incidence rates in the Tamberma area, as well as on the prevalence of the vector. The project implementaton team will need to call on the REDSO/WA Health Advisor to clarify these parameters, and to suggest preventive or mitigative measures that may be necessary to address them. It may be appropriate to request that GOT health authorities direct any ongoing epidemiological work in the project zone in order to clarify the status of the vectors and diseases concerned. They could also help to control the vectors, provide treatment and/or prophalactics to farmers and provide counsel to farmers on simple preventive measures. The Public Health Technical Assistance Team attached to the AID Togo Rural Water Supply project and the planned epidemiologist who is to work on the future AID Combating Childhood Communicable Diseases program in Togo will both be invaluable advisors.

It is important for reasons of potential health problems, that the recommendation on the rice production activities under the project has been deferred. The rice production activity and its production package have not been adequately enough defined to determine its overall environmental viability. It may be found that drainage and other natural factors would minimize the potential for aggravating schistosomiasis and malarial rates. The details of rice production may include measures that would prevent, minimize or mitigate the health problems just discussed. It is suggested that the project take this approach in defining the rice production component. The project agronomist, the REDSO/WA Health Advisor or the REDSO/WA Natural Resources Advisor should be responsible for writing the IEE on this project element, once the necessary data are available.

4. Zoonotic Disease Incidence: The increased proximimity of animals to farmers that will result from the project, increases the potential for human health problems. In response, it has been proposed that the TAT project, PROPTA and the GOT public health services coordinate epidemiological monitoring of animal traction farmers to help reduce the risk of zoonotic disease transmission. For a preventive measure, attention will be taken to combine good animal inspection and health procedures which include sanitation practices. The livestock specialist will work with PROPTA and DVSA staff to develop the needed links with the public health service.

PROJECT COUNTRY: Togo

PROJECT TITLE: Togo Animal Traction Development Project (693-0218)

FUNDING: $4,990,000(Grant)

LIFE OF PROJECT: 5½ YEARS (Initial obligation FY-82) PACD March 31, 1988.

IEE PREPARED BY: _____ for
Vernita Fort
REDSO/WA Natural Resources Advisor

DATE: September 1982

ENVIRONMENTAL ACTION RECOMMENDED:

A. Categorical exclusion for: (1) establishment of the revolving fund where AID does not reserve the right to review and approve individual loans made to farmers for instituting animal traction farming packages, (2) monitoring and evaluation, (3) controlled applied agricultural research, (4) institution building;

B. Deferred recommendation on: (1) well development; (2) building construction, (3) rice production in the bottomlands; (4) animal grazing

C. Negative determination on all other project activities.

GUIDANCE FOR PROJECT IMPLEMENTATION: This IEE not only reviews environmental effects of certain project elements. It also provides critical guidance and directives on the development of other project elements that must be followed to maintain the validity of the project and the IEE recommendation, and to keep environmental problems to a minimum.

Concurrence: _____ Date_____
John Lundgren
AID Representative
USAID/Togo

BUREAU ENVIRONMENTAL OFFICER'S DECISION: George Thompson

Approved: _____

Disapproved: _____

Date: 9/22/82

Clearance: Timothy Bork, GC/AFR_____ Date_____

Identification and Evaluation of Environmental Impacts in Impact Areas

A. LAND USE AND NATURAL RESOURCES

1. Changing the character of the land through:

a. Increasing the population L

b. Extracting natural resources L

c. Land clearing .....M

d. Changing soil character .....L+

2. Altering natural defenses L

3. Foreclosing important uses .....N

4. Irreversible, inefficient commitments L

5. Building/Construction .....U

6. Jeopardizing humans or their work .....N

B. WATER QUALITY

1. Physical state of water L

2. Chemical and biological states L

C. ATMOSPHERIC

1. Air additives .....N

2. Air pollution .....N

3. Noise pollution .....N

D. CULTURAL

1. Altering physical symbols .....N

2. Changes of cultural traditions L

E. SOCIOECONOMIC

1. Changes in economic/employment patterns .....L+

2. Changes in population L

3. Changes in cultural patterns L

F. HEALTH

1. Human nutrition .....H+

2. Pesticide toxicity L

3. Water boone disease vectors .....U

4. Zoonotic disease incidence L

LEGEND

N - No environmental impact

L - Little environmental impact

M - Moderate environmental impact

H - High environmental impact

U - Unknown environmental impact

+ - Positive impact

- - Negative impact

H. Environmental Analysis

This project has been designed to improve agricultural productivity while taking conscientious care in the northern region of Togo, throughout the design process to prevent, minimize or mitigate any environmental problems that may be asssociated with key interventions. As a result of this design strategy, no significant negative impacts are anticipated from the project elements that are adequately enough defined to evaluate at this point. This is substantiated in the IEE and the three pesticide risk-benefit analyses found in Appendix 2 to this annex. The risk-benefit analyses detail the safety and precautionary measures that must be followed to ensure the efficacious use, handling, storage and disposal of the proposed chemicals. For the project elements that will be more fully defined as part of the implementation process, the IEE provides guidelines that the implementation team must use to prevent, minimize or mitigate potential environmental problems commonly associated with the given activity categories.

Those project elements which must be better defined include well development, rice production in the bottomlands of the Tamberma area,.building construction and animal grazing. An IEE must be written for the elements once they are more clearly defined and before any on-the-ground action towards them begins. Certain activities such as training, institution building and controlled applied agricultural research have been categorically excluded from environmental review due to their obvious benign impact on the physical environment.

The important issues concerning land use are detailed in Appendix 1 to this Annex and are mentioned throughout the PP text. Though this project will not fund an activity in land use inventory, planning and management, it unequivocally recognizes the importance of such an activity to the long term success of agricultural production and animal traction in Togo and to sustainable development itself. Thus, the project has identified potential sources and means for addressing this need. With assistance from REDSO/WA, OAR/Lome will issue requests to the S&T Bureau to mount an appropriate land use inventory, planning and management activity, from one or more of the central projects identified in Appendix 1. Such a parallel activity would significantly complement the proposed Animal Traction Development Project, and provide an extremely valuable tool for major land based development activities in Togo. The REDSO/WA Natural Resources Advisor would be the key point of contact and continuity throughout the life of the parallel activity.

Finally, an additional measure that will better ensure the maintenance or improvement of environmental quality in the project zone is the inclusion of environmental expertise in the series of evaluations proposed for the project.

ANNEX NINE: ENVIRONMENTAL ANALYSIS

APPENDIX 3: INITIAL ENVIRONMENTAL EXAMINATION

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Vegatative bands between fields will be planted with indigenous species of trees which will serve as wind breaks, soil stabilizers, fuel woodlots, a source of forage for the draft animals, watershed controls and a source of construction wood.and secondary products. Wherever possible and viable, the project team will collaborate with the FAO which is implementing a forestry project which can complement certain activities in the TAT project. Finally, the parallel activity in land use planning, may provide guidance in this area on a broader regional or country-wide scale, during and beyond the life of this project.

d. Changing the character of the soil

A significant negative impact on the soil is not expected to result from the animal traction project. In fact, the character of the soil may even be improved by a plowing and primary tillage using the power of animals. The effects on soil from the proposed land clearing are not expected to be significant, given the proposed mitigative measures discussed above. Overgrazing, resulting in soil degradation is expected to be prevented by the design and institution of integrated farm systems, comprising sound range management practices.

It is expected that soil quality will be managed through the proper manipulation of the following key factors:

(1) characteristics of plowing such as type of plow, draft power source, depth of plowing, soil mositure at the time of plowing and interactions with the time of planting, texture of the plowed surface, additional tillage for seed bed preparation and time of plowing, (2) cultural techniques associated with the various crops, especially weeding, (3) incorporation of organic material by plowing and (4) the nature of the crops in the rotation, especially of the first crop following plowing. The project implementation team will play a key role in maintaining or enhancing soil quality and facilitate a spread effect through the training of extension agents in soil management and through demonstrations.

Plowing affects soil structure, the water regime, particle size distribution, sensitivity to erosion, organic matter content and microbial activity. Based on studies carried out by Charreau in 1970, it is expected that overall soil condition can be maintained or improved as a result of the proposed project activities. As for soil structure, plowing that incorporates organic matter can result in increased biological porosity (holes and galleries from the work of termites and insects). This results in increased microbial activity, such as rhizobium, improved plant nodulation and ultimately improved yields. With plowing that takes place at the end of the rainy season, hardening of the soils should not occur during the dry season, either in the plowed layers or in the underlying layers. It is expected that the soil water regime will be improved by plowing. Charreau has observed that crops withstand drought periods better when they are planted after plowing. This improvement of the water regime after plowing may be attributed to: 1) improved infiltration of water into the soil, (2) reduction of evaporation, and the conservation of water stored in the soil and (3) improved use by plants of stored soil water. Experiments carried out by Charreau in Africa indicate that plowing does not automatically increase erosion, but in fact can be a soil conserving practice, either by direct action, as on bare soil, or by indirect action through more rapid development of a plant canopy. Increase of erosion after plowing generally results from poor plowing practices against which this project is expected to work.

2. Altering some of the significant natural defenses provided by an area: The project will remove brushland and forests that currently influence the dynamics of their respective watersheds. Removal of the vegetation will effect runoff rates, stream flow, erosion patterns, sedimentation rates and wildlife compositon. While immediate effects may be negative, they can be remedied or mitigated in the near -term through the tree planting and agro-forestry activities related to this project. No other alteration of significant natural defenses is anticipated as a result of the project.

3. Foreclosing important and perhaps better uses of the land: The use of land proposed by the project is considered to be the best of possible scenarios, based on the current level of understanding about land use capability in the African savanna and of the inhabitants' need and demand demand level for land based products. More importantly, use will not be foreclosed. In fact, it is anticipated that the project will result in higher quality land use by developing currently unrealized opportunities that will provide increased and sustainable productivity of agricultural goods, without significant negative environmental impact.

Before agricultural expansion and animal traction reach a high level of intensity, the proposed parallel activity in land use inventory and planning should provide guidance to ensure that important land uses are not foreclosed by decisions made on inadequate information.

4. Irreversible or inefficient commitments of natural resources: With the significant increase in animal numbers in the project zone, concern about the destruction of ground cover and the adequancy of pasture and forage is necessary. The project, as discussed in the technical analysis, will rely on free pasturage through much of 1982/83. With greater animal numbers in future years, provision will be made for stored fodder, feed and nutrients.

The project will rely a great deal on proposed research on test grazing plots, in order to provide guidance on improved pasture management. The livestock specialist, who should be quite capable in range management, will have the responsibility of articulating range and grazing management practices that result in sustained and higher levels of vegetation and animal-production. A critical input to the early project evaluations, will be a range management specialist's evaluation of the grazing and feeding plan that will have been prepared for the project. An IEE will be written for this project element at this time. Recommendations for improvement will be made if and where necessary.

5. Building Construction: Operation centers and housing will be built under the project. Also, a few existing structures will be renovated. The approximate sits have been selected. While soils and site characteristics vary at the various locations chosen across the project area, their selections based on the general criteria of land availability, good drainage (for corral construction), road access, water availability and favorable topography. Once the detailed plans for the structures are developed or a contractor to design and build them has been identified and evaluated for its ability to carry out quality work, an IEE will be prepared for this element. A REDSO/WA engineer, or other qualified party, will make site visits to verify the acceptability of the selected locations and will evaluate the construction proposals and the bidding contracting firms. He/She can prepare the IEE for the project construction elements.

6. Jeopardizing humans or their work because either is put into a zone of potential disaster: None of the project activities are planned for areas subject to unusual harm or disaster such as flooding, earthquakes, high levels of pollutants, insects or other plagues.

B. Water Quality

1. Changing the physical state of water: Only a minimal increase in siltaton that could change the physical state of water is expected as a result of land erosion. Runoff from cleared land could be the cause of such a change. Physical changes in water usually change the chemical and biological state of water by sediments lessening the amount of light that penetrates a water body and through slowed or stopped photosynthesis. Water runoff and erosion will be mitigated by tree planting and agro-forestry activities connected to the project.

2. Changing the chemical or biological states of water: Deleterious changes in the chemical or biological states of water are not expected to result from the project. The biggest threats to water pollution in this project would stem from the misuse and poor handling of pesticides which are proposed for use in the project, and from the potential for animal wastes to be washed into a stream or enter ground or surface water supplies. This can cause excessive nutrient loss to the water supply. Measures have been designed into the project to prevent such water pollution. The measures pertaining to pesticides are described in Appendix 2 of this Annex.

As for animal wastes, an effort will be made to channel them back into the production process as fertilizer rather than be allowed to accumulate and reach unsafe levels around water points. The suggested closed water pumping systems greatly reduce contamination risks. The installation of watering troughs and cattle watering areas will contribute to minimizing water quality problems.

It is not expected that agricultural nutrients from the project will create water quality problems. Nutrients will be managed to enhance crops production and nutrient losses will be controlled through: (1) the timing of any nutrient application which can reduce leaching, (2) rotating crops which reduce the need for nutrient input, (3) refraining from unnecessary or excessive fertilization which reduces potential for nitrate leaching, (4) using animal wastes which enables a slow release of nutrients and improves soil structure, and (5) plowing under green leguminous crops which reduces the need for nitrogen fertilizer.

C. Atmospheric

1. Air Additives: The only addditive that would enter the air as a result of the project is toxaphene when sprayed on the animals in Tantiegou. Given the relatively small amount to be sprayed and the multiple precautionary measures designed into the project, the air additive and water quality impacts are expected to be quite minimal.

2. Air Pollution: The only source of air pollutants generated by the project would be the few project vehicles necessary for implementing the project. The exhaust impact is expected to be minimal to insignificant.

3. Noise Pollution: The only noticeable noise resulting from the project will come from the construction activities and vehicles. The former will be minor and short lived, and the latter minimal and dispersed.

D. Cultural: This project is not expected to destroy important physical symbols of a culture or dilute the cultural patterns that would weaken the group development

among the project participants. In fact, a key feature of this project is its intent to provide the project participants with the means to direct and control the development of their own farms. This is to be done through providing the farmer-adopters with information, skills and resources that they can use as tools in improved farm management and in strengthening the opportunity for the continued evolution of their culture.

Rather than imposing certain practices on the farmers, they will be provided with options. The farmers, through PROPTA, will be encouraged to contribute to the broader planning and decision-making process for animal traction activities in the Kara and Savanes regions.

E. Socio-economic

1. Changes in economic growth and employment: As detailed in the economic analysis of this PP, economic growth, increased employment and higher incomes are programmed results of this project. The economic and technical analyses show that land and natural resources are available to support this growth, and that the growth and returns should be able to pay for the initial investment required to catalyze it. The project level analysis shows that for the first few years following the adoption of the animal traction technology, net farmer incomes will decrease. The socio-economic impacts of the agricultural packages and the project as a whole will be monitored throughout the life of the project. Farmer income should be about 80% higher than at EOPS than when the project began. Internal rate of return is estimated at 10% over fifteen years.

2. Movement, resettlement or changes in population: Human movement and resettlement are not necessitated by the project, nor does the project indirectly or directly encourage such patterns in a significant way. Any changes in the population should result from natural growth rates, and only to a slight extent from increased

well-being, generated by the project. The proposal agricultural expansion is generally located within easy access to resident farmers and will not require any dislocation of existing settlements.

3. Changes in cultural patterns that could affect socio-economic patterns in a major way: This project will evoke changes in cultural practices that should have a gradual change on socio-economic patterns. A great deal of socio-economic data was collected and analyzed by the design team so that the project could be shaped to affect socio-economic patterns in a positive way. The Social Soundness Analysis provides details and regards the design teams efforts as potentially successful in this respect.

F. Health

1. Nutrition: Human health should be improved through the improved nutrition that is expected to result from the Togo Animal Traction Project. The composition and the quantity of the food to be produced and consumed by the farming population are the key factors.

2. Pesticides Toxicity: Potential health hazards are associated with the use of some of the proposed pesticides. In response, measures have been designed into the project to prevent or mitigate such hazards. These measures are detailed in

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the Environmental Assessment for toxaphene and the risk-benefit analyses for thiram and creosote, all found in Appendix 2 to this annex.

3. Water Related Disease Sectors: The development of rice in the bottomlands of the Tamberma area could create health problems. The standing water in the bottomlands for rice production is a habitat for snails and mosquitoes which are vectors for schistosomiasis and malaria, respectively. Concerning these two water related diseases, additional information is needed on their incidence rates in the Tamberma area, as well as on the prevalence of the vector. The project implementaton team will need to call on the REDSO/WA Health Advisor to clarify these parameters, and to suggest preventive or mitigative measures that may be necessary to address them. It may be appropriate to request that GOT health authorities direct any ongoing epidemiological work in the project zone in order to clarify the status of the vectors and diseases concerned. They could also help to control the vectors, provide treatment and/or prophalactics to farmers and provide counsel to farmers on simple preventive measures. The Public Health Technical Assistance Team attached to the AID Togo Rural Water Supply project and the planned epidemiologist who is to work on the future AID Combating Childhood Communicable Diseases program in Togo will both be invaluable advisors.

It is important for reasons of potential health problems, that the recommendation on the rice production activities under the project has been deferred. The rice production activity and its production package have not been adequately enough defined to determine its overall environmental viability. It may be found that drainage and other natural factors would minimize the potential for aggravating schistosomiasis and malarial rates. The details of rice production may include measures that would prevent, minimize or mitigate the health problems just discussed. It is suggested that the project take this approach in defining the rice production component. The project agronomist, the REDSO/WA Health Advisor or the REDSO/WA Natural Resources Advisor should be responsible for writing the IEE on this project element, once the necessary data are available.

4. Zoonotic Disease Incidence: The increased proximimity of animals to farmers that will result from the project, increases the potential for human health problems. In response, it has been proposed that the TAT project, PROPTA and the GOT public health services coordinate epidemiological monitoring of animal traction farmers to help reduce the risk of zoonotic disease transmission. For a preventive measure, attention will be taken to combine good animal inspection and health procedures which include sanitation practices. The livestock specialist will work with PROPTA and DVSA staff to develop the needed links with the public health service.

ANNEX NINE ENVIRONMENTAL ANALYSIS

Appendix 1

LAND USE ISSUES

LAND USE

The expansion of agricultural production in the project zone has important implications for other land-based production activities in the region. The most immediate and visible impact of expansion is the clearing of land that may support important vegetative resources depended upon by the inhabitants to meet critical needs. For example, forests and brush are cleared as a result of agricultural expansion. This means that important sources of energy, namely fuelwood and work wood will be removed. Wild faunal species that depend on these habitats, will also be reduced in numbers, and in turn a protein source for the inhabitants is reduced. With the acceleration of animal traction as a preferred GOT approach to agricultural production, the incorporation of an increased number of animals into the land use schema will be required. Responsive grassland and livestock management will be necessary to ensure that adequate forage is available, that grasslands are not degraded and that optimum levels of vegetative and animal productivity are sustained. Such changes also have implications for the functioning and productivity of entire watersheds. The change in vegetative makeup and land use in one part of the watershed means changes in erosion patterns, stream flow and siltation rates in another part of the watershed. Changes in the aquatic environments will occur as well.

Given the population growth rate in the project zone and in the country, the demand for the zone's multiple natural resource products is increasing. The competition for land will intensify between different and important uses such as agriculture, forests, rangelands and livestock, energy crops and watershed controls. The land area itself is finite which means that sooner or later a higher quality of natural resource utilization will be needed. Piece-meal and ad-hoc land and natural resource development will not be adequate to address the emerging issues. Opportunities for efficient, complementary and optimum levels of resource productivity will be lost. Finally, the piece-meal approach inherently risks solving one problem, say in agriculture, at the expense of creating or aggravating another problem, such as deforestation which triggers impacts in the areas of energy, fiber and watershed stability and productivity. The merits of robbing one area to pay another are certainly questionable in terms of net benefits to the target population, as well as of economic efficiency.

It is important that agricultural development and animal traction in the project zone be treated within the broader context of coherent land use planning and natural resource management. It is not anticipated that the Togo Animal Traction Development project will in and of itself, significantly aggravate the type of land use problems discussed above. The project scale is relatively small, and mitigative and responsive measures, such as tree planting and technical monitoring have been designed into the project. However, the implications of this project merit concern when considered in conjunction with the other ongoing and planned land based activities in the region over time. Assuming that this project will be successful, the GOT, through the DRDR of the Kara and Savanes regions, will have improved its capability to expand agricultural productivity with animal traction as the central technique, beyond the project life. Consequently, this analysis considers it imperative that in the near future, the GOT acquire the necessary means for developing agriculture in a rational manner for optimum and complementary productivity. A viable methodology is necessary for carrying out such a sustainable and comprehensive process of resource inventory, planning and management which is adapted to the Togo context.

LAND INVENTORY, PLANNING AND MANAGEMENT

In response to the foregoing issues, the project implementation team and OAR/Lome will assist in the development of a parallel activity in land use inventory, planning and management, through AID's Science and Technology Bureau (S&T). During the development of this PP, multiple discussions were held with S&T officers on the availability of central funds that can assist the GOT to enhance its capability in land use inventory, planning and management. In the course of these discussions, and a review of the S&T portfolio, several potential candidates for providing the needed support were identified.

OAR/Lome will need to issue a request to the S&T bureau for support from these projects early enough in the life-of-project so that outputs would be able to complement the progression of the Togo Animal Traction Development project and provide land use planning and management tools in a timely fashion for follow-on activities. The REDSO/WA Natural Resources Advisor is expected to assist OAR/Lome formulate the specific request to S&T and develop a scope of work for the requisite expertise. The REDSO/WA Advisor will also be a key point of contact and continuity throughout the life of the parallel activity.

The four central projects listed and described below, represent possible sources of S&T support, and services in land use inventory, planning and management. These four projects appear to be the most promising of those investigated by the Natural Research Advisor on the

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design team. There may be other possibilities. New central projects may be developed in the near future , which are relevant to the land use concerns described above. They may be on-line by the date of project implementation. The opportunity for having a parallel land use activity that is centrally funded appears to be good. Upon approval of this project, AID/Togo, with support from REDSO/WA, will begin requesting services from the following four projects, but should not be necessarily limited to considering only these four.

Pest Management and Related Environmental Protection (931-0930)

This project can provide the following services:

1) develop an information/data base, including narrative, maps and overlays on the current land use and related trends, land capability, and land suitability;

2) provide training to appropriate officials in the concepts and methods of land use inventory, planning and management; and

3) recommend a methodology that the GOT can employ and a plan of action that the GOT can undertake, that will lead to: a) agricultural development treated in the broader context of rational land use, and b) improved land use and natural resource use and productivity. A process should be identified and initiated that will result in a land use plan for the project zone, upon which subsequent agricultural and other land resource activities could be based.

Environmental Planning and Management (936-5517)

This project is designed to:

1) provide short and medium-term advisory services to AID missions and host governments on matters related to natural resource management, land use planning, environmental protection, surveying, integrated natural resource inventory and related project design;

2) mount larger term pilot activities that build host country capability for coherent natural resource management planning. A pilot activity to develop a natural resource management strategy will be carried out in one or more countries. Togo and/or its northern regions could be one of these countries. These activities will support a national or subnational regional planning effort to develop an appropriate and effective resource strategy for the selected area, integrated with or forming the basis of the broader development plans for that area;

3) provide information and analyses on selected topics and issues. This component has three elements: a) documentation of advisory services, b) state-of-the-art papers on the integration of natural resource/environmental concerns into the development process and c) comparative studies of important issues.

The aforedescribed project is being supported by a joint agreement between AID's Science and Technology Bureau, Division of Forestry and Natural Resources (ST/FNR), and the International Institute for Environment and Development (IIED). Joint funding results in a total budget of $ 3.5 million. Given proposed time frame for the project, project activities as outlined above, should begin by January 1983 with the project life extending through October 1985. By October 1982, the cooperative agreement between ST/FNR and IIED will be negotiated, a project staff will be put in place and operational agreements with AID's regional bureaus will be developed. It will be important that the Africa Bureau identify its level of desired involvement to ensure that resources from this S&T project could be made available to Togo upon request.

Soil Management Support Service (931-1229)

This project provides coordinated short-term techncial assistance in the areas of soil survey, soil fertility, land use planning and soil conservation, as well as basic support for the improvement of an international soil classification system. It will help synthesize cost-effective field operations needed for rapid efficient development, and more long-term productive utilization of land resources.

The project began in 1979 and is scheduled for completion in FY 89. The total project budget is $ 8.65 million, with about $ 6.0 million remaining at the present time.

AID/Togo will issue a request for support from this project. Again, the REDSO/WA Natural Resources Advisor will participate in defining the request and developing a scope of work, directed towards producing the outputs designated above for the parallel land use inventory, planning and management activity.

Global Land Cover Mapping

AID, FAO and UNEP are now in the process of developing agreements with NASA and with each other to participate in the NASA initiated

project, Global Land Cover Mapping. The project collects land resources data by means of satellite imagery, aerial photographs and ground truthing, and presents it on maps at various scales depending on need, with supporting narratives. NASA has recognized that to increase the utilization of this data, coordination with organisations like AID, FAO and UNEP, would be valuable.

Though the agreements are not finalized, the AID remote sensing specialist who is backstopping AID's inputs, is confident that AID will become formally involved. This means that additional central resources will be available to address land use problems and opportunities in AID client countries. Decisions, with clarity about the scope and content of the project,should be made known by the end of 1982.

ANNEX NINE ENVIRONMENTAL ANALYSIS

Appendix 2: INSECTICIDE / PESTICIDE RISK - BENEFIT ANALYSES FOR TOXAPHENE, CREOSOTE AND THIRAM

A. The USEPA Registration Status

1. Toxaphene is registered by the U.S. Environmental Protection Agency as an insecticide on livestock pest and certain crops. In the Togo Animal Traction project, Toxaphene is proposed for use as an insecticide against livestock pests.

EPA has issued a notice of "Rebuttable Presumption Against Registration" (PRAP) against toxaphene. RPARs are issued on pesticides whose current EPA registration status is being re-evaluated, based on the following risk criteria: 1) acute toxicity, 2) chronic toxicity, 3) other chronic effects, 4) significant reduction in endangered species, wildlife and nontarget species and, 5) lack of emergency treatment or antidote. After the required review and analysis is undertaken on any such pesticide, EPA makes a regulatory decision on the chemical in question.

According to AID environmental Regulations, 216.3(b)(1)(iii), if the project includes assistance for the procurement or use, or both, of any pesticide for which an RPAP has been issued, the IEE Threshold Decision will provide for the preparation of an Environmental Assessment (EA). Thus, the following Environmental Assessment has been prepared at the level of detail deemed to be appropriate for indicating the environmental implications of the use, distribution, storage and disposal of toxaphene as proposed in this project, and in the format prescribed in the Regulations.

It should be noted that in addition to the precautionary measures incorporated into the project concerning pesticides and insecticides, additional services from the S&T project, Pest Management and Related Environmental Protection (931-0930), will be requested. The Pesticide Management Specialist of AID (ST/AGR), has expressed an interest in fielding expertise to Togo, in order to supplement the work of the project agronomist in pest control and pesticide management. With this input, optimum pest control and pesticide management systems may be implemented.

Before any toxaphene is procured, its use in the project and the full range of implications must be thoroughly discussed with the GOT. A joint understanding of hazards and a joint effort of minimizing them is necessary and is requested by the AID Environmental egulations.

2. Creosote is registered by USEPA as an insect repellent, an acaricide, an herbicide, an arachnicide, fungicide, tree dressing, a disinfectant, and a horse repellent. It is registered for use on animal pests only if the animals to be treated and their projects such as milk, will not be consumed or eaten. In the Togo Aminal Traction project, creosote will be used as an insecticide against livestock pests, under the conditions stipulated by the EPA.

3. Thiram is registered by USEPA as a seed protectant. Thiram, with red dye, will be used for this registered purpose in the Togo Animal Traction project.

B. The Basis for Selection

1. Toxaphene was selected based on knowledge of its superior effectiveness compared to known alternatives for controlling livestock pests, given the proposed method of use and precautionary measures designed into the project. The merits of toxaphene compared to possible alternatives, are discussed under Section I of this Environmental Assessment.

2. Creosote was selected because of its observed success in controlling key insect pests on livestock, its familiarity, in terms of its use and application, to farmers in the region, its availability in the region, and its appropriateness as a second-level control method in the three-tier integrated approach propsed for animal pest control.

3. Thiram was selected primarily based on its superior effectiveness, compared to the few other permissible alternatives, in reducing agricultural losses from seed decay, damping-off and seedling blights caused by many seed-borne and soil-borne organisms. The merits of thiram compared to the few other alternatives, are discussed under Section I of the risk-benefit ananlysis.

C. The Extent to which the Proposed Pesticide Use is Part of an Integrated Pest Management Program

1. An integrated approach for controlling livestock pests among the project animals is anticipated in that three complementary levels and forms of control will be employed. Upon purchase of animals at Tantiegou, a toxaphene mixture will be sprayed on them. Secondly, creosote will be considered as a maintenance procedure that the extension agents and farmers can use once the animals are distributed to the Extension Support Centers (CAT's) or are in the

farmers' possession. The third level of control would be the removal of pests by hand. The chemical methods and the pysical method complement each other and their integration contributes to the effectiveness, efficiency, hazard minimization and cost savings desired in controlling the target livestock pests.

At the initial point of acquiring animals, spraying them with toxaphene mixture is considered the preferred method. A large volume of animals can be treated at any one time and the thoroughness of the method will mean that the CAT's and the participing farmers will receive relatively pest-free animals. The likelihood of introducing new pests into the area will thus be reduced. The centralized site at Tantiegou for treating animals with toxaphene, and only once, in a spraying operation that has a recycling system, minimizes the potential for contaminating the environment and overexposing the animals.

2. The application of creosote is proposed as be the second level of animal pest control. Creosote is currently widely used by the farmers to control ticks at the farm-level. This practice will be continued with thorough guidance on safe application and handling. The use of creosote will be limited, given the expected effectiveness of toxaphene and the resulting role of creosote, as an intermittent pest control maintenance measure.

The control of animal pests by hand will be the third component in this integrated approach. This method becomes important at the farm-level, where more sophisticated forms of pest control are less accessible and their hazards more difficult to control. Also, since each farm will have only a relatively few number of animals to treat, and the proposed chemical control methods should have reduced pests considerably, the hand control method is reasonable, and also effective.

Given the monitoring results that should emerge from this project, it is expected that useful data will be available that may provide guidance for the development of an improved integrated pest management approach.

3. An integrated approach to pest management that minimizes the use of chemicals, will be undertaken in implementing the project's agricultural packages. The use of thiram to dress seeds for controlling various seed and seedling diseases, will be the initial step in the integrated approach. Beyond seed treatment, the approach will include crop management practices that contribute to controlling pests. Such practices include crop rotation, optimizing the planting time to prevent attack by certain insects and diseases, and intercropping to modify the spacing of plant, or planting com-

binations of different crops in the same field. Additionally, mechanical control practices will be employed to eliminate plants that inhibit the desired crop growth. Such practices will include pulling weeds by hand or using farm hand tools, covering weeds with mulch to prevent growth, and plowing and harrowing with animal traction. These methods are all normal.

D. The Proposed Method or Methods of Application including Availability of appropriate Application and Safety Equipment

1. The toxaphen will be applied by spray racers to be built at the buying center. Toxaphene bought at 46% solution will be diluted with water to 4.6%. Approximately 6 to 7 liters of the mixture will be sprayed on each animal, leaving approximately 2 liters on the animal. Low volume, battery operated sprayers constitute the basic application apparatus. The application equipment and associated safety equipment will be required along with the other commodities to be obtained for implementing the project. Safety equipment designed into the project includes a recycling system for the runoff from the spraying operation. In this way the contamination of water, feed, forage, and soil can be prevented and thus toxic exposure to live organisms prevented or greatly limited. In addition to the proposed safety equipment and measures, training in the safe use, application, handling and storage and disposal is included as a project component. The proposed training is outlined in Section K of this environmental analysis.

2. Creosote will most often be applied by traditional means. Split sorghum stalks will be used as brush applicators by the project participants. Specific safety equipment beyond protective gloves, for the application of creosote is not deemed necessary. However, training in the careful use and handling of creosote is deemed necessary and regarded as very important. Such training and precautionary measures are designed into the project as indicated elsewhere in the PP text and in Sections B,C and E of this environmental analysis.

3. The thiram will be mixed in a sealed container. The seeds will be treated after they are well cured in a container with thiram dust formula. The container or drum (depending on quantity of seed), will be rotated until the seeds are adequately covered with the protectant. One gram of thiram will be needed for 100 grams of corn, millet, sorghum or groundnut seeds. Safety equipment including dry filter dust mask or goggles and rubber gloves, will be provided under the project to minimize hazards associated with the use of thiram. Long sleeve shirts, pants and shoes will be required for those handling the pesticide and treated products. The poten-

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tial hazards of thiram are addressed in Section E.

E. Acute and long-term Toxicological Hazards, either Human or Environmental, associated with the proposed Use of Toxaphene Measures available to minimize such Hazards

1, Toxaphene is poisonous to humans when taken orally, inhaled, or brought in contact with skin. The acute oral LD 50(rat) is toxaphene is 60 mg/kg. It is toxic to fish, birds and other wildlife. It should be kept out of lakes, ponds, streams, tidal marshes and estuaries. Toxaphene should not be applied where runoff is likely to occur or when weather conditions favor drift from areas treated. Shrimp and crab may be killed at application rates recommended on the label. Toxaphene is also toxic to bees.

As mentioned above in Section D, measures which can prevent or minimize the associated hazards are incorporated into the project. They include the installation of a recycling system for the runoff from the spraying operation and the provision of protective gloves and chemical goggles to the applicators and handlers. Persons using or handling the toxaphene will be required to protect the whole body through wearing appropriate clothing and goggles, furnished under the project. Training will be provided that informs users and selected participants about the potential hazards of toxaphene and how to prevent or minimize them. A system of checks will be instituted to insure that toxaphene in appropriate concentrations of water (o.5 - 0.6%), is not applied to any animal that would be slaughtered for consumption within 28 days of application.

Since intermittent rather that prolonged exposure to toxaphene is not anticipated, a pesticide respirator is not included in the project. If increased treatment is recommended over the project life, the use of toxaphene will be assessed during the mid-point evaluation, as will the other project components, and appropriate changes made.

Concerning disposal, a tank will be built and installed with a strong liner for the disposal of excess toxaphene that will come primarily from the recycling system. The objective will be to get rid of the excess moisture from the toxaphene solution, so that the remaining dry residue of the toxaphene, is confined to the plastic container and prepared for safe burial.

The storage of toxaphene will be fully controlled at the northern center, the only project location where the toxaphene will be applied. It will be stored in very close proximity to the project site. It will be stored in a manner to prevent leakage, unapproved use, and exposure to high dangerous temperatures.

2. Creosote has been reported as toxic to humans and livestock and is carcinogenic. For humans, creosote through improper handling, is reported to be a potent skin and eye irritant, where cases of permanent vision damage have been reported. Concerning livestock, animals have become ill or have died from creosote poisoning. Creosote has also been reported as fetotoxic to livestock. Excessive doses can produce sterility in bulls and abortions in sows. A common route of exposure is often reported as the ingestion of creosote through animals licking wood or other products treated with creosote, or through their accessibility to it due to poor handling, storage or disposal. Most information which is available regarding the environmental fate of coal tar and coal tar products such as creosote, addresses the impacts of the chemical as a wood preservative and its entry into the ecosystem through the decomposition of treated wood. If through improper handling, application or storage, supplies of creosote are permitted to enter either the aquatic or terrestrial environment, the contamination of organisms, soiland water is possible.

Several measures have been designed into the project to minimize the hazards noted above. It will be essentiel to institute a system that insures that animals treated with creosote, and their animal products such as milk, will not be eaten or consumed. The project agronomist,with assistance from the S&T/AFR Project, Pest Management and Related Environmental Protection (931-0930), will have responsibility for instituting such a system. The system will be evaluated during an early project evaluation. If it is not found adequate, an alternative system or alternatives to creosote itself will be sought.

Also, all farmers participating in the project who will potentially be using creosote, will receive training about the hazards of the chemical. They will also be trained in safe methods of use, handling, storage and disposal. These practices and those associated with all of the chemicals proposed in the project, will be rigorously evaluated early in the project life, to insure that hazards are minimized.

3. The acute oral LD 50 of thiram for mammals is 375-865 mg/kg. For rats, the LD 50 is 780 mg/kg. For humans, thiram is an irritant to eyes, nose, throat and skin, and is harmful if inhaled or swallowed. Thiram is toxic to fish and should be kept out of lakes, streams, ponds and water supplies. Measures, described above, are available to minimize the human and environmental hazards which will be incorporated into the project. Only trained individuals will be permitted to handle thiram. Hand and face washing after use will minimize human toxicological hazards.

Precautionary measures to prevent the pesticide from entering aquatic environments and contaminating the terrestrial environment, will be put in place.

Thiram, as the other pesticides proposed for the project, will be under controlled storage. In this way, leakage and inappropriate acquisition and use can be guarded against. Once acquired by the project, the thiram will be stored under dry and preferably cool conditions. For safe disposal, the containers will not be reused, but rather buried away from water supplies in a safe place when empty. Distribution packets will be of a size so that makeshift containers will not have to be used for distributing the thiram. In this way thiram will always be identifiable in its own labeled sack, and the dangerous reuse of exposed makeshift containers can be avoided. Precautions will be taken to insure that food and feed is not contaminated by thiram and that treated seed is not eaten.

The red dye in the thiram provides one additional precautionary measure. In the unlikely event that treated seed remains unused, the red color will signal that it is unsuitable and dangerous as feed for livestock or for human consumption.

F. <u>The Effectiveness for the proposed Use</u>

1. Since the 1950s, toxaphene has demonstrated quite a high rate of effectiveness for the proposed use throughout the world. According to pest management specialists in AID/W, the efficacity ot toxaphene has been systematically tested and rates as an active and reliable acaracide.

2. The effectiveness of creosote as an insecticide against pests associated with livestock has been widely demonstrated over time. Effectiveness and acceptance has also been clearly demonstrated in the project zone. The effectiveness rate of creosote is considered appropriate as a second level and maintenance treatment and in conjunction with the control of certain pests by hand.

3. Thiram has demonstrated effectiveness in increasing agricultural yields by reducing losses from seed decay, damping-off and seedling blights caused by seed borne and soil borne organisms. According to AID pesticide management expertise in S&T/AGR, this effectiveness has been demonstrated over a number years, and for a variety of seed types, in its widespread use throughout the world, including the Africa region.

G. Compatibility with target and non-target Ecosystems

1. The use of toxaphene as proposed in this project, is deemed to be compatible with the target and nontarget ecosystems, in that significant disturbance of the ecosystem is not likely. Significant disturbance would occur if toxaphene entered the water supply, or associated lakes, ponds, streams, marshes or estuaries. Aquatic habitats are not predominant in the target ecosystem, and measures are incorporated into the project to insure that water bodies in the target and nontarget ecosystems are not contamined by the pesticide. The recycling system of the spraying operation will prevent runoff containing toxaphene from entering water bodies and disturbing target and nontarget ecosystems. Measures are also included for the storage and disposal of toxaphene that will reduce the potential for disturbance to the target and non-target ecosystems, as described in Section E above.

2. Creosote is deemed with the target and nontarget ecosystems, in that with proper use, significant disturbance to the ecosystems is not likely. If through improper handling, application, or storage, supplies of creosote are permitted to enter either the aquatic or terrestrial environment, contamination of organisms, soils and water is possible.

   The project animals will be the immediate recipients of the creosote in the ecosystem. With proper use, handling, storage and disposal, as provided in the project, it is not anticipated that the creosote will be introduced into the ecosystem beyond the animals nor that the animals will be improperly exposed. A key concern will be making sure that the animals treated with creosote and their products such as milk, are not eaten or consumed.

3. Thiram, as proposed in the project, is deemed compatible with the target and non-target ecosystems in that significant disturbance to the ecosystems is not anticipated. An extremely small amount of the pesticide will be used relative to the size of the project zone. Even though thiram is a mercury compound that degrade to a permanent residue, negative impacts to the ecosystem should not occur if the prescribed application use and handling procedures are employed. Significant ecological disturbances could occur if a sufficient amount of thiram enters any associated ponds, lakes, streams, estuaries or marshes, or the drinking water supply. Aquatic habitats are not predominant in the target or non-target ecocystems, and application, storage and disposal measures are incorporated into the project to ensure that water bodies are not contamined. Measures to prevent contamination of the soil by thiram are also included.

They include the control of such parameters as soil moisture content, soil organicmatter content and the timing of planting treated seeds.

H. The Conditions under which the Pesticide is to be used, including Climate, Flora, Fauna, Geography, Hydrology and Soils

It should be noted that toxaphene will only be distributed to and used at the buying center in Tantiegou. Otherwise, the same general conditions apply for all the pesticide and insecticide proposals for this project.

Northern Togo, the broader region in which the project will be implemented, is characterized by savanna woodland. Average annual rainfall is approximately 1078 mm, where the majority of rain falls between the months of May and September. High ambient noonday temperatures during the dry season average around 35 - 37 degrees C while early morning temperatures during the dry season are around 23 - 25 degrees C. The dry winds of the harmattan usually occur in January and February.

The natural vegetation of the area consists largely of Guinea Savanna shrub and tree species. Occasional stands of teak introduced within this century are found in the area. However, due to burning and pressure for fuelwood, much of the natural vegetation has been displaced by the cultivation of corn, cassava, yams, rice, sorghum and cotton. A few relic forests stands in hydromorphic depressions and along water courses. Tropical ferrillitic soils, and a geological base of granite and schists, typify the region.

Two perrenial streams which are tied together, the Oti and the Keran, flow through the northern region. Other seasonal streams in the region are tributaries to the Oti and the Keran. The Oti and Keran Rivers consitute the receiving base for the larger watersheds in the region. Groundwater studies are currently being undertaken by the GOT (in collaboration with UNDP) to determine the actual capacity of the acquifers.

Fauna consists largely of wild savanna woodland species. Lions, leopards, elephants, and antelope are occasionally observed in the larger region, given the nearby established game reserves. Monkey, hippopotamoises and crocodiles are also found. Rabbits and various rodent species along with snakes and lizards occur as well. Of course domestic animals are found in the zone, including cattle, sheep, goats and pigs. There are many varities of birds, insects and freshwater fishes.

I. The Availability and Effectiveness of other Pesticides and Nonchemical Control Methods

1. Toxaphene has been identified as the preferred pesticide for treating the newly acquired animals at the buying center, given its demonstrated effectiveness, the unlikely event of it causing ecological disturbance and its costs. Dipping tanks and necessary chemicals were considered for use in the project. However, the maintenance and cleanliness problems of dipping and the problem of maintaining proper user concentrations makes the proposed spraying system more attractive.

   Other pesticides were considered which are more target specific. However, they were determined to be less effectiveness and more expensive that toxaphene for meeting project needs. Also, the supply and availability of toxaphene is more certain than of the identified alternatives.

   Malathion was considered, but due to the high level of resistance the target pests have established in the target area, the effectiveness of malathion would be less than what is needed.

2. Creosote has been identified as the most suitable chemical to address the intermediate pest control need. It is effective, available and has minimal toxity problems compared to those resulting from the commercial spray can insecticides available in open markets that farmers use when alternatives are not available. Upon consultation with the pesticide management advisers in AID, superior alternatives were not known for creosote as a secondary animal pest control measure in the three-tier system.

3. Viable alternatives using thiram as a seed protectant in this project do not exist. Chlorinated hydro-carbons which have been used as seed dressing, have been suspended or cancelled and the copper sulphur base chemincals do not protect as well as thiram against seedling disease. The alternative of not using seed dressing is not viable, given the resulting anticipated losses in agricultural yields and consequent loss of economic viability.

J. The Requesting Country's Ability to Regulate or Control the Distribution, Storage, Use and Disposal of the Insecticide

The Government of Togo has had only limited experience in regulating or controlling the distribution, storage, use and disposal

of pesticides. This project presents an opportunity to strengthen the pesticide control and regulation practices of the government institutions through which the project will be mounted. The Regional Directorate of Rural Development (DRDR), The National Animal Traction Program (PROPTA) and the Directorate of Pedology are government institutions that are expected to benefit. A relatively comprehensive Crop Production Service is in place, albeit underequipped and understaffed. It has a relatively large research division that looks primarily at crop resistance to insect damage. The project implementation team, along with expertise from the previously noted pest management projects out of S&T/AGR, will assist these institutions to improve or establish pesticide regulation and control measures. In this way, the project can better insure that the safe distribution, storage, use and disposal of pesticides are continued and maintained beyond the project life.

K. The Provision for Training of Users and Applicators

Training is a major feature of the project. Trainers will be taught the techniques of animal traction, animal care and improved agricultural production. As an integral part of this training, appropriate parties will be taught about the properties of the pesticides to be used in the project and instructed in the correct and safe techniques for handling, using, storing and disposing them. Training will also include instruction on what should not be done with the chemicals that may be commercially or publicy accessible and that should not be used. This training component is also defined elsewhere in the Training Analysis. In addition, expertise from the S&T project, Pest Management and Related Environmental Protection (931-0930), will be made available, upon request, to assist with defining the training program in pesticide use, in even more detail.

L. The Provisions made for Monitoring the Use and Effectiveness of the Insecticide

A complete agricultural monitoring program is to be established under the project to follow changes that occur in the implementation of the various components. This monitoring system as described elsewhere in the PP text, also addresses the use and effectiveness of the three pesticides prescribed for the project. In addition, the first evaluation to take place during the early

stages of project implementation, will include a thorough review of the effectiveness, use, handling, storage, disposal and any negative impacts of pesticides employed in the project. The training element on the safe and effective pesticide use and handling will also be evaluated at this time. The results of the monitoring and of the evaluation will provide guidance for redressing any inefficiencies or problems that could have emerged during the period evaluated, or provide reassurance that effectiveness is high and negative environmental impact is low or nil.

ANNEX TEN

FINANCIAL PLAN

PROCUREMENT PLAN

AID Financed Commodities and Source/Origin:

AID funds made available under the Grant will be used for the procurement of the following commodities by source/origin:

A. Code (000) U.S. only:

1. Office equipment (part)
2. Veterinary equipment and veterinary pharmaceuticals (part)
3. Animal/farm equipment (part)
4. Training equipment (subject to equipment selection and availability)
5. Surveying equipment (subject to equipment selection and availability of metric system gradations)

B. Code (935) Either purchased locally or specifically imported:

1. Four-wheel vehicles, trail motorcycles, mobylettes and bicycles
2. Animal/farm equipment (tool kits, tarpaulins, pumps)
3. Kerosene/electric refrigerators
4. Office equipment: Manual typewriters, Duplicators, Photocopiers and Electronic Scanning Machines

Specific source/origin waivers are being requested from AA/AFR in this PP for:

Four-wheel vehicles, trail motorcycles, mobylettes and bicycles, refrigerators and office equipment such as manual typewriters, duplicators, photocopiers and electronic scanning machines.

C. Indigenous Items/Shelf Items:

1. Revolving Fund (animals, traction equipment, veterinary items-partial)
2. Operating Expenses (POL, utilities, office/paper supplies and job printing)
3. Construction/Contracting Services and Construction Materials required under the project are readily available locally. Items include cement, iron reinforcing bars, aluminum roofing and some plumbing and electrical fixtures, as appropriate. Construction materials are not broken out separately. They are lumped together as part of the cost of locally obtained contract construction

services. The small magnitude of construction activity called for under the project is another reason for this treatment of the item.

Local cost shelf item procurement as authorized in HB 1, Supplement B, Chapter 18 will be utilized for procurement commodities and equipment which are normally imported and kept in stock in the form in which they are imported for sale to meet a general demand.

It is expected that local currency financing will amount to approximately $2,466,000, of which it is estimated that $400,000 will be required for shelf-item (indigenous items) procurement. However, a waiver is being requested of the authorized limitation to ten percent (10%) of Code (935) Shelf Items financed by AID, to a limitation of 20 %, as appears elsewhere in this PP.

Host-Country Commodity Inputs:

Timing of the host-country funding contributions is not crucial to contemplated procurement of AID-financed inputs.

Methods of Procurement

A. Code (000) items will be procured in accordance with AID HB 11, Chapter 3 through a host-country selected U.S.-based procurement services agent (PSA), concurred to by AID. Payment for these items will be through an AID/W issued direct letter of commitment, initiated by an OAR/Lome approved PIO/C.

   The GOT does not have at present, the capability to implement the necessary procurement actions, and there are no private concerns in Togo capable of executing procurement in accordance with AID regulations. The small projected service charges payable to the PSA precludes formal IFB selection of the PSA. Exceptions to use of the PSA might occur in those instances where the OAR/Lome, in collaboration with the JAO, may procure directly from U.S. suppliers on behalf of the host-country for selected items under GSA contracts.

B. Code (935) items to be imported specifically for the project will be procured under appropriate waiver authority by the OAR/Lome, in collaboration with the JAO, on behalf of the host-country.

C. Local shelf items, or indigenous commodities, will be procured by the host-country implementing agencies in accordance with established AID procedures using advances and/or reimbursement methods.

   Project Implementation Orders (PIO/C) will be used in all cases under which procurement is made, i.e., to establish an AID/W direct letter of commitment to the PSA and to cover OAR-issued purchase orders, or

reimbursements to the host-country. PIO/C documentation is to be drawn up by the AID project manager, in consultation with the project implementation/management unit and cleared by the AID Representative in Lome prior to submission to the Director of REDSO/WA for approval. Purchase orders for specific items covered under the PIO/C's will be issued by OAR, with the collaboration of the JAO in Lome, as necessary.

Transportation and Insurance:

A. Ocean transportation and insurance costs have been calculated at 60 percent of FAS cost for furniture and major appliances, and 50 percent of FAS cost for other large equipment pieces. Ocean transportation and insurance will be arranged by the PSA or the GSA contractor, depending on the item.

   Items procured in the U.S. will be shipped to the port of Lome in U.S. flag bottoms. U.S. flag bottoms call regularly in Lome. Lome is a modern unencumbered port with good handling and warehouse facilities, and with an excellent security record.

B. Air transportation and insurance costs, via air freight, are calculated at the rate of $5.00 per pound. Whenever feasible small items bought in the States will be grouped in large trunk-like cases and shipped as unaccompanied baggage, and charged to the project. Air shipment routes to Lome are best arranged via Paris. U.S. flag carriers can be used from the U.S. to Paris. Non-U.S. flag carriers, up to five flights per week, have a reputation for efficient and rapid delivery of goods at the Lome airport warehouse.

C. All imported items, from whatever source, will be addressed to the AID Representative, American Embassy, B.P. 852, Lome, Togo. The Government of Togo, Ministry of Rural Development, does not staff a shipping and receiving unit that is capable of efficiently expediting the receipt, clearance, temporary storage and delivery of imported commodities for donor-funded development projects. The project field implementation and management team is situated up-country, approximately 300 miles from the coastal capital of Lome, and will be unable to play a primary, initiatory role in the range of operations required to handle the reception of imported items. The Joint Administrative Office (JAO) of the American Embassy in Lome will arrange custom clearance, temporary storage and local handling, and will notify the AID project manager, within OAR, of the arrival schedule of commodities and the personal/household effects (including POV) of the technical assistance members. The AID officer will notify the project management unit (Project Coordinator and Project Director) in Kara of this information. The project management unit will promptly arrange for any extended storage needs and/or will arrange inland transportation, either with project vehicles (including those vehicles which are supplied as part of the GOT project contribution) or by other vehicles provided by the GOT, as required (insurance of commodities after arrival in Lome will be limited to those items which may be transported

by a rented vehicle, and the charges will be borne by the GOT).

Motorized vehicles, of all sorts, procured by the project, are the only manufactured commodities which are to be locally insured with AID funds over the life of the project. Insurance for four-wheel vehicles will include personal liability, collision, fire and theft. (The GOT does not insure vehicles registered in its name, and is its own insurer.) Draft animals, distributed to farmers, are also to be covered by insurance in certain eventualities, under the condition of strict observance of a plan of animal care. This program is discussed elsewhere in this paper.

Records and Accounting

The JAO will keep arrival records and any related accounting records, and provide copies for both the AID project manager and the project implementation/management team leader, the Project Coordinator. The JAO in Lome is staffed with shipping and receiving personnel who are trained in standard USG (AID) procurement and transportaton procedures and have experience in drawing up and keeping the essential records.

The JAO is seconded in its receiving responsibilities by a senior administrative assistant (FSN) in the OAR. All fiscal documentation in support of the total cost of goods and services to be procured and transported under this project will be drawn up in the OAR by the senior administrative officer for review and certification by the AID project manager.

In instances where procurement is made other than through a PSA, payment documentation will be administratively approved by the AID project manager and sent by weekly air pouch to the West Africa Accounting Center within REDSO/WA at Abidjan for approval and authorization of payment. Given that WAAC's review of invoices reveals a certifiable expenditure under the project, authorization for payment is made by WAAC and a check is ordered from the Regional Administrative and Management Center in Paris generally within fifteen working days after receipt of all documentation in Abidjan. Checks for payment of commodities and services procured in-country and in Code (935) countries will be ordered in the currency specified by the supplier, addressed to an account or address of his choice.

Reimbursement to PSA, for expenditures incurred in procurement of commodities and services in the U.S. will be approved by AID's New York certifying office and paid by dollar check issued by AID/W FM/BFD against the underlying letter of commitment.

Operations and Maintence of Commodities

No special assembly, erection or start-up services are required for any of the commodities which are scheduled to be procured under the project. No manufacturers' representatives will be required to travel to Togo to assist in the installation of equipment, or in training in the operation and maintenance of any commodities. The equipment to be procured is of a sufficiently

simple design as to be set up and operated with ease by Togolese personnel with their current level of skills or aptitudes. In many cases, commodities of the the sort which are being procured under this project, already exist in-country and personnel are familiar with their utilization.

In the case of special office equipment, such as manual typewriters, photocopiers, electric stencilers and mimeograph machines, Togolese sales and service centers are firmly established and have spare parts, operating materials and trained repair personnel to support machine functioning and maintenance. Maintenance and repair agents of these office equipment supply centers make regular visits to major northern cities within Togo to service equipment on-site. Some parts and office material supplies are found in northern bookstores and stationery shops.

Maintenance and repair of four-wheel vehicles procured under the project is assured at several levels. As part of the GOT contribution to the project, three mechanics are assigned to the project vehicle fleet which will include two station wagons, three pick-up utility vehicles (U.S. contribution) and several trucks to be used primarily for the transportation of project livestock (GOT contribution). The mechanics are outfitted with simple garage tools procured under the project to permit them to carry out first echellon maintenance and the replacement of some used parts. Mechanics in Togo are generally well-trained in technical schools, and have a wide range of abilities relevant to support of vehicles which must be driven on Togo's outback roads. Several large sales and services garages, representing major European and Japanese car and truck manufactuers, are located in Lome, with branch part-outlets situated up-country in some cases. A well-equipped garage is located in Yade, ten kilometers from Kara, and central to the project's northern operations. The garage mechanics work under the supervision of a German volunteer under a long-term arrangement which is expected to continue. The AID animal traction activity frequently had the occasion to use the garage's services satisfactorily. The garage's management has agreed to take on the project's mechanics, one at a time, to give them additional training. This training would be at no cost to the project.

The makes and models of motorcycles, mobylettes and bicycles, scheduled to be procured under this project (assuming that the appropriate waiver is granted) exist already in Togo. The network of parts and service has been built up over the years. The specific models to be procured have been chosen for their general ruggedness and reliability as well as for the regional availability of replacement parts. Peace Corps volunteers are given an intensive training course in the use and field maintenance and repair of their own motorcycle. Users of all two-wheel vehicles procured under the project are given a monthly fuel and up-keep allowance by the project which must be specifically accounted for in order to obtain replenishment. Major repairs will be handled separately.

The farm and livestock equipment to be procured under this project is of U.S. manufacture and is generally considered to be of the most durable construction that can be obtained. No difficulties in reliability of operations and maintenance capability are foreseen. Only the four livestock scales will require any particular attention in their installation and upkeep. Livestock scales of European manufacture exist in the country, and

Togolese technical personnel are familiar with their operation. The livestock specialist member of the technical assistance team is also expected to have experience in the basic operation of veterinary equipment.

EQUIPMENT LIST

The project equipment and material list included below is intended to be specific enough so that the AID project manager, assigned to OAR/Lome, in consultation with the Interim Project Coordinator, will be able to draft Project Implementation Orders for Commodities, based on the descriptions given here.

Vehicles

Station wagon, 5 passenger, 4-doors with rear hatch-style tailgate. Outfitted with radial tires. Given rural road conditions and limited passage ways in farm areas, wheel-base (turning radius) should be small. Vehicle should be outfitted with heavy duty shock absorbers and a metal protective plate under the crankcase. Vehicle should not be equipped with emission control devices, multi-barrel carburators, heater or rear-window defroster. Estimated vehicle fuel consumption should be rated no less than 20 mpg for open country driving. Vehicle should be equipped with air conditioner due to extended hot season and need for T.A. members to perform often and well after extensive travel.
Suggested sources: (Geographic Code 935 procurement is being requested for all project 4 and 2-wheel vehicles.)
Suggested sources: French manufacturers, such as Peugeot or Renault; Japanese manufacturers, such as Datsun or Toyota.

Light-weight pick-up wagon, 3 passenger, bench seat, with flat rear carrying space of approximately 6 m^3 dimensions, with an approximate load capacity of 400 kilos. Vehicle should be easy-to-turn, have manual steering, with short wheel base. Special specifications: radial tires, heavy-duty shock absorbers and a metal protective plate under the crankcase. Vehicle should not be equipped with emission control devices, multi-barrel carburators or heaters. Vehicle should be equipped with a canvas (or canvas-like) removable tarpaulin. Estimated vehicle fuel consumption should be rated at no less than 25 mpg for open country driving.
Suggested sources: (see Station wagon, above.)

Motorcycle, commonly referred to as "trail-bike", of about 100 cubic centimeter piston displacement rating, capable of withstanding rugged treatment on dirt and gravel back roads and paths. Special specifications: heavy-duty shock absorbers, kick-start, protective shield over raised muffler/exhaust system. Estimated cycle fuel consumption should be rated at 80 k/l. Cycle should have its own basic tool repair kit. Should be devoid of fancy trappings. A sturdy baggage carrier, mounted behind the seat, is desirable. Trail-bike type tires are required. Five speeds. With tire pump. Front headlight and rear running and break lights.
Suggested sources: Japanese manufacturers, such as Yamaha, Honda and Suzuki.

Mobylette, a motorized bicycle of less than 50 cc piston displacement. Single seat with a rear-mounted light-weight baggage carrier. No fancy trappings, with a rear-view mirror, buzzer mounted on handle bar, front headlight and red rear riding light. Equipped with basic tool repair kit, tire pump.
Suggested source: France.

Bicycle, of simple construction, three speeds, hand breaks, medium-weight frame and medium-weight tires (non-racing characteristics). Single seat with a light-weight baggage carrier behind. No fancy trappings, with a single battery-operated light in the front and a reflector in the rear. Equipped with a basic tool repair kit and a tire pump. Should be easy to maintain by owner of no special mechanical aptitudes. Warning bell mounted on handle bar.
Suggested sources: Japan, Taiwan, Members of the European Economic Community.

Office equipment and furniture

Photocopier, any-paper copier for use in an office, with single sheet feeder system. Equipped with accessories: standard letter-size cassette, standard legal-size cassette, ledger-size cassette, universal cassette, drum kit, and heater roller kit. Supplies should include toner (1400 gram bottle, 60 ea.) and developer (1 1.2 Kilo bottle, 10 ea.). Electrical requirements; 210-220 volts, 50 Hz, with three-pronged, properly grounded connection.
Suggested source: Sharp Electronics Corporation, Government Marketing Center, 2341 Jefferson Davis Highway, Arlington, Virginia 22202, as under agreement with the General Service Administration,

Federal Supply Service, Authorized Federal Supply Schedule, FSC Group 36 Part IV Class 3610, Contract No. GS-00S-41025 (Effective through September 30, 1982).

Electronic Scanning Machine, table top model, capable of automatic production of a facsimile of an original on an electronic regular or paper stencil or P.R.P. copy paper, with simultaneous preparation of an overhead projection transparancy, if desired; to handle originals of app. 270mm x 375mm with variable scanning rate between 150 to 650 lines per inch during 3-14 minutes for a 178mm original; self-cleaning stylus, with exhaust filter and plastic safety cover.
Electronic requirements: 210-220v/50Hz, with three pronged, properly grounded connection. Suggested sources: (see Duplicator, below)

Duplicator, plain paper, semi-automatic loading with floating feedboard, capacity of app. 500 sheets of 20 lb duplicating paper, with digital counter, automatic inking with operator override, automatic or "operator mode" selector, capable of producing up to 150 copies per minute. Electrical requirements: 210-220v/50Hz, with three-pronged, properly grounded connection. Duplicating area of app. 210mm x 340mm. Supplies should include paper stencils and ink.
Suggested source: Gestetner Corporation, c/o Government Contracts Manager, 2151 Arlington Blvd., Arlington, Virginia 22201, as under agreement with the General Service Administration, Federal Supply Service, Authorized Federal Supply Schedule FSC Group 36 Part II,A and B; FSC Class 3610; Contract No. GS-00S-23622 (see extension of last contract, valid through June 30, 1982).

APPENDIX I: BUDGET BREAKDOWNS

TABLE 1

TECHNICAL ASSISTANCE

- $ -

	YR 1	YR 2	YR 3	YR 4	YR 5	1/2 YR 6	
LONG TERM							
Interim Coordinator[1]	87,980						
Project Coordinator[2]		129,980	129,980	129,980	192,980	64,990	
Ag. Economist		129,980	129,980	129,980	129,980	64,990	
Livestock Specialist		129.980	129,980				
Agronomist		129,980	129,980				
SHORT TERM							
Livestock[3]				16,500	16,500		
Agronomist				16,500	16,500		
Training/Data Management		25,000	12,500	12,500			
EVALUATION[4]							
Mid-term			33,000				
Final					22,000		
Secretarial/Translation			7,000		10,000		
	87,980	544,920	572,420	305,460	324,960	129,980	
TOTAL TECHNICAL ASSISTANCE							1,966,220

[4] The mid-term evaluation includes 3 persons for about 4 weeks each at an estimated cost about $11,000 per person and the final evaluation includes 2 persons for 2 wks each at the same unit cost.

Footnotes to Table 1, Technical Assistance

1 $87,980 for year 1 includes $62,980 for an Interim Project Coordinator during the transition period from the beginning of project activity to the arrival of the technical assistance team. Assume a base salary of $22,000 with differential, COLA, travel to and from US, rent, utilities and other costs totaling $40,980. The remaining $25,000 is for a second interim staff member who is to be recruited in Togo and is familiar with Peace Corps/Animal Traction activities to assist the Interim Project Coordinator.The Facilitator would be on a PCS contract including housing and per diem.

2 The average yearly cost of one Technical Assistance Team member assuming a family of four is calculated as follows:

Base salary	$35,000
Differential	7,000
COLA	1,050
Travel R&R or to/from post)	8,000
Travel (emergency/medical)	2,000
Air and sea freight	9,415
POV	2,500
Residence Rent/Utilities ($7,000/2,100)	9,100
In-country per diem	5,880
DBA (insurance)	1,190
Education allowance	4,000
Storage	3,000
Overhead (@ 1.9)/Fee (@ .08)	41,845
Total	$129,980

In country per diem assumes average travel of 7 days per month times 12 months times per diem of $70 which is a weighted average of Lome per diem (currently $87) and up-country ($57) based on anticipated travel. During the last six months of project activity TA costs will remain the same before inflation for one person year divided between the Project Coordinator and the Ag Economist.

3 The Livestock and Agronomist short-term technical assistance during years 4 and 5 will be for 6 weeks each, calculated as follows;

Salary (36 days)	$5,400
Per diem (42 days @ $70)	2,940
Travel (to/from US)	2,000
Secretarial/translation	550
DBA	184
Communications/other	134
Overhead and Fee	5,292
Total	$16,000

The short-term assistance by training or data management personnel in years 2,3 and 4 is costed using the above breakdown. The durations of these trips are about 9 weeks for year 2 and about one month for year 3 and 4.

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APPENDIX I : BUDGET BREAKDOWN

Table 2

COMMODITY PROCUREMENT

	QUANT.	UNIT PRICE	TOTAL	SUB-TOTAL	YR 1	YR 2	YR 3	YR 4	YR 5	U.S. TRANSPORT
VEHICLES (C.I.F.Lome)[1,2]										
Station Wagon	4	10,000	40,000		20,000		20,000			W[4]
LT WT Pick-up Wagon	6	7.500	45,000		22,500		22,500			W
Trail Bike (100 cc)	26	1,000	26,000		13,000		13,000			W
Mobylette	30	500	15,000		7,500		7,500			W
Bicycle	50	100	5,000		2,500		2,500			W
Spare Parts (25%)			32,750		16,375		16,375			
				163,750						
ANIMAL/FARM EQUIPMENT										
Scales	4	1,000	4,000		4,000					(2,400)[5]
Self-Catch Gates	5	500	2,500		2,500					(1,500)
Tags	10,000	0.5	5,000		5,000					(2,500)
Tarpaulins (10m x 10m)	20	500	10,000		10,000					
Motor and Pump	2	5,000	10,000			10,000				(6,000)
Misc., Tools and Equipm.			3,500		3,500					
				35,000						
VETERINARY EQUIPMENT										
Syringes/Needles	20	20	400		400					(240)
Innoculations Guns	10	40	400		400					(240)
Sterilizers	10	20	200		200					(120)
Balling Guns	10	15	150		150					(90)
Spearing Equiment	5	200	1,000		1,000					(600)
Frigo Kerosene/Elec.	26	500	13,000		6,000		7,000			W
Misc.			1,850		1,850					
				17,000						
TRAINING EQUIPMENT[3]				50,000		25,000	15,000	10,000		
SURVEY EQUIPMENT[3]				50,000		30,000	20,000			

Table 2 (cont.)

COMMODITY PROCUREMENT (cont.)

	QUANTITY	UNIT PRICE	TOTAL	SUB-TOTAL	YR 1	YR 2	YR 3	YR 4	YR 5	U.S. TRANSPORT
OFFICE EQUIPMENT										
Safe	1	350	350		350					
Typewriter, manual	16	400	6,400		3,200		3,200			W
Typing Table	8	125	1,000		1,000					
Sharp Drypaper Copier	4	5,000	20,000		10,000		10,000			(12,000)
Photostencil	2	4,000	8,000		4,000		4,000			(4,000)
Mimeograph Machines	8	500	4,000		2,000		2,000			(2,400)
Desk Calculators with Printers	14	150	2,100		1,050		1,050			
HP-, Printers, Program Library, Data Cards	6	700	4,200		2,100		2,100			(2,100)
				46,050						
Director's Reception Salon	1	2,500 Q	2,500		2,500					
Office Desks	8	600 Q	4,800		4,800					
Office Chairs	9	175 Q	1,575		1,575					
Tables with Drawers	20	125 Q	2,500		2,500					
Straightback Chairs	63	39 Q	1,890		1,890					
Filing Cabinets, Metal, 4-Draw, Legal, Lock	20	800	16,000		16,000					(9,600)
Cabinets, Armoire-Style, Lock	16	260 Q	4,160		4,160					
Bookshelves	14	200 Q	2,800		2,800					
				36,225						
Electric Lamps	10	100	1,000		500		500			
Electric Fans	10	100	1,000		500		500			
Kerosene Lamps	60	7	420		210		210			
				2,420						
TOTAL COMMODITIES				400,445						

Footnotes to Table 2, Commodity Procurement

1 Quoted unit price is indicated with "Q". Where CFA quote was obtained an exchange rate of 300 CFA = $1.00 was used. Quotes for office equipment were obtained from a supplier at Kara, project headquarter site. Other unit prices are based on estimates from U.S. farm and veterinary catalogs and Togolese vendors.

2 Vehicles are to be replaced during year 3, assuming life of 2 to 2 1/2 years.

3 Training and survey equipment is mostly available locally, with 25% of each expected to be purchased in the U.S. during year 1.

4 Items for which waivers are requested to permit Code 935 procurement.

5 Non-add. See Table 5, Operating Costs.

APPENDIX I: BUDGET BREAKDOWN

Table 3

CONSTRUCTION

	SQUARE METERS	COST M2 $	TOTAL COST $	SUB-TOTAL $	YR 1	YR 2	YR 3	YR 4	YR 5
KARA									
1. Office block with Director's office, Director's secretary, Accounting, Secretary pool, 2 T.A. offices, Conference room, Bathroom, Corridor space 1	215	250	53,750		53,750				
2. Director's house - 3 bedrooms	150	250	37,500		37,500				
TOTAL				91,250					
AGBASSA									
House CAT-type	40	185	7,400	7,400	7,400				
TANTIEGOU									
1. A. Office block: 2 offices	40	185	7,400		7,400				
B. Storehouse	20	185	3,700		3,700				
C. Veterinary supply house	20	185	3,700		3,700				
D. Machinery, Equipment	20	185	3,700		3,700				
TOTAL				18,500					
2. Holding Pastures/Pens									
A. Fenced Pasture - 5,000m x $6/m			30,000		30,000				
B Gates 20 x $50 ea.			1,000		1,000				
C. Pen/Corral/ Alley/Shute 100m x $20			2,000		2,000				
Crush/Squeeze 40m x $60			2,400		2,400				
D. Pumping Station, Water Reticulation			10,000		10,000				
TOTAL				45,000					

Table 3 (cont) CONSTRUCTION (cont)

	SQUARE METERS	COST M2 $	TOTAL COST $	SUB-TOTAL	YR 1	YR 2	YR 3	YR 4	YR 5
TECHNICAL SUPPORT CENTERS (CAT)									
1. New Construction									
A. Naki-Est	140	185 + 29.29	30,000		30,000				
B. New Savanes Site (Bogou?)	140	185 + 29.29	30,000		30,000				
C. Warengo	140	185 + 29.29	30,000		30,000				
D. Kagnissi/Pagouda	140	185 + 29.29	30,000		30,000				
E. New - to be determined	140	185 + 29.29	30,000		30,000				
				150,000					
2. Renovation[2]									
A. Gando			6,000		6,000				
B. Nampoach			6,000		6,000				
C. Toaga			6,000		6,000				
D. Kante			6,000		6,000				
E. Existing - to be determined			6,000		6,000				
				30,000					
WATER WELLS									
5 CATs, 2 Centers @ $10,000/ea.	40	250	70,000		70,000				
				70,000					
TOTAL CONSTRUCTION				412,550					

[1] All construction estimates include 17% for increased costs before actual completion of all construction which is likely to be year 2. Cost per square meter are based on quotes by REDSO Engineering Office after site visits.

[2] Most construction expense is for the construction of 5 new technical support centers at a cost of about $214 per square meter and the 7 wells. Renovation of 5 existing centers will yield considerable savings with a unit cost of $6,000.

[3] All construction is in local currency through Togo-based contractors.

APPENDIX I: BUDGET BREAKDOWN

Table 4

REVOLVING FUNDS

DESCRIPTION	QUANTITY	UNIT PRICE	TOTAL COST	SUB-TOTAL	U.S.PRO-CUREMENT (Transport)	YR 1	YR 2	YR 3	YR 4	YR 5
ANIMAL REVOLVING FUND[1]										
ANTRAC	1,000	250	250,000			225,000	75,000			
Pilot Herds [2]	200	250	50,000			50,000				
				300,000						
EQUIPMENT REVOLVING FUNDS[3]										
Multicultivator	500	250	125,000							
Carts	500	250	125,000							
				250,000		125,000	125,000			
VETERINARY REVOLVING FUND[4]										
Drugs - Tantiegou			11,000		(5,500)[5]	11,000				
Drugs - Abgassa			2,500		(1,250)	2,500				
Feed Supplements			10,000			10,000				
Misc.			1,500			1,500				
				25,000						
TOTAL REVOLVING FUNDS				575,000						

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Footnotes to Table 4, Revolving Funds

1 The animal purchasing revolving fund is set at $250,000 to cover the outlay for all animals to be purchased by farmers participating in the project through the CNCA credit program as well as to supply temporary working capital for animal purchase for other animal traction projects and donors when necessary. For the approximately 200 animals sold to project farmers annually, the fund will decrease by $50,000 and will begin to be replenished in year 2 by 20% of outstanding loans. It is possible that the fund will await reimbursement of cattle purchases for up to several months from other projects due to their own liquidity fluctuations and common delays in receiving payments. Thus, the size of this fund will allow PROPTA to meet maximum demand from project farmers and other projects with a realistic repayment schedule. Given that before year 2, funds used to purchase animals for other donors/projects will have been repaid as well as 20% of loans to project farmers, most of the revolving fund should be made available during the first year to meet cash flow needs.

2 A pilot herd revolving fund of $50,000 made available during year 1 will allow a rapid build up of 200 cattle. Turnover of the herd is estimated at about only 6% per year through credit sales to farmers (via CNCA) and new cattle purchases. Thus the fund must be large enough to purchase all 200 cattle before considering inflows and outflows.

3 The equipment revolving fund is sufficiently large to purchase equipment for all project farmers. Replenishment of the fund depends on the equipment subsidy given, if any.

4 The veterinary revolving fund for drugs will finance direct purchase of vaccines and all cattle will be priced to include vaccination cost. When a project farmer receives an animal on credit he will pay a down-payment sufficient to immediately repay the vaccination costs. Thus fund replenishment from project farmers will be immediate and not in proportion to loan balance repayment. The feed supplements and miscellaneous fund will be directly replenished as farmers purchase animal health services on a cash basis.

5 Transportation costs of items (or parts thereof) marked for U.S. procurement are non-add here. They are listed for indicative purposes only and are included in Table 5, Operating Costs.

APPENDIX I: BUDGET BREAKDOWN

Table 5

OPERATING COSTS

	YR 1	YR 2	YR 3	TY 4	YR 5	1/2 YR 6	
Vehicle Pool[1]							
5 cars	5,700	11,400	11,400	11,400	11,400	5,700	
Motorcycle Pool							
$50 x 12 mo.x 13 units	3,900	7,800	7,800	7,800	7,800	3,900	
Mobylette Allowance							
$10 x 12 mo.x 15 units	900	1,800	1,800	1,800	1,800	900	
Bicycle Allowance							
$5 x 12 mo.x 25 units	750	1,500	1,500	1,500	1,500	750	
Incentives[2]	4,000	4,000	4,000	4,000	4,000	2,000	
GOT per diems[3]	4,000	4,000	4,000	4,000	4,000	2,000	
Office Utilities[4]	600	1,200	1,200	1,200	1,200	600	
Kerosene[5]	600	600	600	600	600	300	
Paper & Office misc. [6]	6,100	12,200	12,200	12,200	12,200	6,100	
Job Printing[7]	3,900	7,800	7,800	7,800	7,800	3,900	
Training [8]	5,000	10,000	10,000	10,000	10,000	5,000	
Transport (U.S.-Togo)[9]	65,540						
TOTALS BY YEAR	100,990	62,300	62,300	62,300	62,300	31,150	
TOTAL OPERATING COST ALL YEARS							381,340

Footnotes to Table 5, Operating Costs

1 Vehicle maintenace based on average maintenance cost to date. Motorcycle maintenance is budgeted at $50 per month based on present experience for Peace Corps and agricultural projects in the region. Normal maintenance costs for mobylettes and bicycles average $10 and $5 per month, respectively.

2 Incentives are based on GOT rates and are not considered an automatic subsidy. Personnel assigned to the project are asked to perform at a level which is considered clearly superior to normal standards. The Project Director makes the decision to make incentive payments, based on his knowledge (supported by work documentation and reporting of Sector Chiefs) of actual work performance. Incentives are denied to those performing at a level below what has been determined to be the high standard set for project personnel. None of the potential recipients are officials of the Government of Togo, but are employees who are hired on an "as needed basis", and paid from the GOT operating account.

3 GOT per diem is based on GOT rates and expected travel.

4 Office utilities for Kara and Atakpame facilities are based on monthly cost of water as $10, electricity at $20, and telephone at $70. Utility installation costs are included in the GOT contribution.

5 Kerosene is for security night lanterns at each project site and for refrigerators at Agbassa and Tantiegou.

6 Paper and office supplies are found in local stationary stores. These costs cover principally those needs of the Technical Assistance Team. The GOT contribution supplements this line-item.

7 Job printing will be done in Togo for reports and evaluations.

8 Training costs enable the project to supplement the training budgets of the GOT (DRDR's) in order to organize field and classroom sessions.

9 Transport costs are based on the following standards:

- 60% of FAS for furniture and major appliances,
- 50% of FAS for other large equipment pieces,
- Airfreight at $5.00 per pound.

ANNEX TEN

APPENDIX

FINANCIAL PLAN

OFFICE EQUIPMENT BY SITE

	QUANTITY	UNIT PRICE	TOTAL COST	SHELF ITEM	US PROCUREMENT
A. KARA OFFICE					
- Typewriter, manual (replaced YR 3)	10	400	4,000	yes	
- Typing tables	5	125	625	yes	
- Sharp Drypaper Copier (replaced YR 3)	2	5,000	10,000	no	6,000
- Mimeograph machines (replaced YR 3)	4	500	2,000	no	1,200
- Desk Calculators w/printer (replaced YR 3)	8	150	1,200	yes	
- Desks, office	5	600	3,000	yes	
- Chairs, for desks	5	175	875	yes	
- Chairs, straightback	15	30	450	yes	
- Director's reception salon (armchairs, sofa, coffee table)	1	2,500	2,500	yes	
- Filing Cabinets, metal, 4 drawers legal, lockable	10	800	8,000	no	4,800
- Cabinets, armoire-style, lockable	3	260	780	yes	
- Lamps, electric	8	100	800	yes	
- Fans, electric	8	100	800	yes	
- Bookshelves	5	200	1,000	yes	
			36,030		

OFFICE EQUIPMENT BY SITE

	QUANTITY	UNIT PRICE	TOTAL COST	SHELF ITEM	US PROCUREMENT
B. TANTIEGOU ANIMAL BUYING STATION					
- Safe	1	350	350	yes	
- Typewriter, manual (replaced YR 3)	2	400	800	yes	
- Typing tables	1	125	125	yes	
- Desk Calculators with printer (replaced YR 3)	4	150	600	yes	
- Desks, office	3	600	1,800	yes	
- Chairs, desk	4	175	700	yes	
- Chairs, straightback	12	30	360	yes	
- Tables, with drawers	2	125	250	yes	
- Cabinet, armoire-style, lockable	2	260	520	yes	
- Filing cabinets, metal, 4 drawers legal, lockable	4	800	3,200	no	1,920
- Bookshelves	3	200	600	yes	
- Kerosene lamps (replaced)	15	7	105	yes	
			9,410		
C. AGBASSA TRAINING/HERD CENTER					
- Desk Calculators with printer (replaced YR 3)	2	150	300	yes	
- Filing cabinets, metal, 4 drawers legal, lockable	2	800	1,600	no	960
- Bookshelves	2	200	400	yes	
- Kerosene lamps (replaced)	15	7	105	yes	
			2,405		

OFFICE EQUIPMENT BY SITE

	QUANTITY	UNIT PRICE	TOTAL COST	SHELF ITEM	US PROCUREMENT
D. ATAKPAME - PROPTA OFFICE					
- Typewriter, manual (replaced YR 3)	4	400	1,600	yes	
- Typing tables	2	125	250	yes	
- Drypaper copier (replaced YR 3)	2	5,000	10,000	no	6,000
- Photostencil machine (replaced YR 3)	2	4,000	8,000	no	4,000
- HP- , printer, program, library, data cards (replaced YR 3)	6	700	4,200	no	2,100
- Filing cabinets, metal, 4 drawers legal, lockable	4	800	3,200	no	1,920
- Cabinet, armoire-style, lockable	2	260	520	yes	
- Bookcases	4	200	800	yes	
- Lamps, electric	2	100	200	yes	
- Fans, electric	2	100	200	yes	
- Mimeograph machines (replaced YR 3)	4	500	2,000	yes	
			30,970		

OFFICE EQUIPMENT BY SITE

	QUANTITY	UNIT PRICE	TOTAL COST	SHELF ITEM	US PROCUREMENT
E. CENTRES D'APPUI TECHNIQUE (Technical Support Center)					
Naki-Est, Gando, Toaga, Kagnissi/Pagouda, Warengo, Nampoach, Kante, 2 sites to be determined					
- Table with drawers	9	125	1,125	yes	
- Table, work	9	125	1,125	yes	
- Cabinet, armoire-style, lockable	9	260	2,340	yes	
- Chair, straightback	36	30	1,080	yes	
- Kerosene lamps (replaced)	30	7	210	yes	
			5,880		

RECAPITULATION

A. KARA	36,030
B. TANTIEGOU	9,410
C. AGBASSA	2,405
D. ATAKPAME	30,970
E. CATs	5,880
TOTAL	84,695

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ANNEX TEN

FINANCIAL ANALYSIS

CONTRIBUTION OF THE GOVERNMENT OF TOGO

Togo, inspite of its current déficit financial situation, is not on the relatively least developed country (RLDC) list. This could pose a specific administrative problem because of AID's requirement of 25% host government contribution to the total project cost. (At the time this PP was drafted, the United Nations Economic and Social Council recommended that the General Assembly approve the inclusion of Togo in the list of Least Developed Countries at the next plenary session, beginning in October 1982.)

While 22% of the Third Five-Year Development Plan (1976-1980) was devoted to agricultural development and related industries, actual investment lagged considerably behind. Despite having failed to meet its own established financial commitment to agricultural development over the previous planning period, the government has emphasized in the Fourth Five-Year Development Plan (1981-1985) that it will stress agricultural self-sufficiency. The rural sector is slated to receive 35% of the Plan's total planned investment of 250.9 billion CFA ($833 million at the current rate of exchange). Approximately 89.6 billions CFA ($300 million) or 36% of the planned minimum investment, is scheduled to come from internal financing, both public and private.

The Fourth Five-Year Plan document has already inscribed 192 million CFA (approximately $460 thousand) as a direct contribution to investments in the Togo Animal Traction Development Project over the life of the activity. To planned investments, and additional 48 million CFA (approx. $160 thousand) is ear-marked for operational cost, for a total of $800 thousand of direct GOT contributions (investment and operational cost) to the project. Salaries (or portions thereof) paid by the GOT, of those Togolese who are (or will be) assigned to the GOT animal traction structure, either at the national level (PROPTA), or at the level of the Kara and Savanes regions are estimated to amount to an additional $526 thousand. This figure was arrived at by conservatively estimating the percentage of time that GOT employees will be called upon to render specific services to the animal traction program. Portions of salaries of high-ranking government officers serving in policy positions have not been included, even though they may devote considerable time and energy to the promotion of animal traction.

A monetary figure should be ascribed to the value of the goods and services that the GOT will place at the disposal of the animal traction project by way of its regular annual allocations to two entities: the Regional Rural Development Organizations (DRDR) of the

Kara and Savanes regions, and the investment and operating costs of PRODEBO which are presently supported, and which will be continued under PRODEBO's new format, PROPTA. The Fourth Five-Year Plan projects expenditures for the two DRDR's at about $28 million, of which at least five percent can be fairly attributed to specific linkages to animal traction backstop programs. PROPTA, its structure, attributions and budget yet to be promulgated by ministerial order, is expected to receive substantial GOT financing, primarily for animal traction support operations in the three southern-most economic regions, but also in direct support of the national structure, in collaboration with the AID contribution. The design team and GOT officials estimate that in general, about one-third of PROPTA's account could be considered as a direct participation in the same national animal traction program to which AID funding is herein commited.

The likelihood that these planning figures will be met by the GOT in the course of project implementation has been enhanced in recent months. This is due in part to the momentum which has been gained by animal traction, as the locomotive of the government's food production campaign. The institutionalization of an inter-ministerial coordinating committee solely for the definition and execution of animal traction activities, has placed this improved farm technology squarely in the forefront of national priorities. Funding of implementation activities has followed, to date, the GOT's stated policy. The current AID sponsored animal traction AIP has enjoyed a GOT contribution which has totaled over 40 percent of total project costs over the three-year life of the project. Of a more official nature, the GOT in an agreement with the International Monetary Fund, has committed itself to spending a greater percentage of its development budget to improve agricultural programs in the rural sector. With motorized tractor operation in Togo only a remnant of their short-lived strength of four years ago, major allocations of funds are going towards support of basic farming activities, with the accent on food production. Animal traction-oriented activities are important recipients of government resources. The large thrust planned over the next five years in promoting the production of cotton is promised on the expansion of cultivable land through animal traction.

The exact level and nature of the GOT contribution cannot be determined at this time, nor can this document pretend to commit funds for the Government of Togo. However, extended discussions between members of the project design team and ranking officers of the GOT have led to an approximate listing and costing out of probable GOT contributions to the project. Some costs are relatively easy to identify and estimate (vehicles, vehicle operating costs, personnel costs of the Kara office). Other costs are less easily isolated and less-well spelled out (eventual miscellaneous construction, shared personnel costs of the Atakpame office, etc.) However, the design team believes

that the figures given below are an honest and conservative representation of the GOT contribution to the project. Taken altogether, and ascribing contingency and inflation rates similar to these applied to the AID budget, the approximate total GOT programmed contribution to this project amounts to 500 million CFA ($1,669,221), or fully 25.1% of the total project cost, and 34.5% of the AID contribution.

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Indicative Budget of the Government of Togo Contribution

	Monthly	
I. Personnel:		
Kara Headquarters/Agbassa Center:		
Project Director	$300	
Financial Direcor* (BAC-Togo Scale)	267	
Training Director	166	
Center Director	200	
Secretary	83	
Accountant** (BEPCM-Togo Scale)	133	
Typist (2)	132	
Office Clerks (5)	330	
Drivers (3)	200	
Herders/cattlebreakers (13)	780	
Carpenters/masons/other workers (15)	900	
Warehouseman (1)	60	
Security guards (2)	120	
	$3,671	
Life of project personnel costs (66 months)		$242,286

* post secondary school training in accounting
** secondary school training in accounting

Tantiegou Animal Buying Center:		
Director of Operations	267	
Training Director	166	
Secretary	83	
Security guards (2)	120	
Herders (2)	120	
Cattle buyer	117	
Accountant (BEPCM)	133	
	$1,006	
Life of Project (66 months) x 75%		$49,797

(It is estimated that Tantiegou employees will spend and average 75% of their time for project related activities.)

PROPTA Headquarters - Atakpame:	Monthly	
Director	$400	
Deputy Director	300	
Training Director	217	
Equipment Director	217	
Animal Health Director	217	
Financial Director	267	
Director of Monitoring/Evaluation(M&E)	217	
Assistant Director for Animal Health	166	
Assistant Director for M&E	166	
Assistant Director for Training	166	
Accountant	133	
Secretary	83	
Typists (2)	132	
Drivers (3)	200	
Security guards (2)	120	
Office clerks (2)	132	
	$3,133	
Life of Project (66 months) x 50%		$103,389
(Assumes 50% average time attributable to project)		
Technical Support Centers (CAT's) (11 centers - includes Kamina)		
Herders (11)	660	
Cattle breakers (11)	660	
Security guards (11)	660	
	$1,980	
Life of Project (66 months)		$130,680

Summary Personnel Costs:	
Kara/Agbassa	$242,286
Tantiegou	47,797
PROPTA	103,389
CAT	130,680
Life of Project Peronnel Costs	$525,152

II. Vehicles:

PROPTA (Kara/Agbassa/Tantiegou)

Units	Have	YR-1	YR-3	Unit Cost	Subtotal
8-ton truck	(1)	1	2	$21,000	$63,000
3-ton truck	(1)	1	2	14,000	42,000
Pick-up truck	(0)	3	3	9,000	54,000
Station wagon	(1)	0	1	14,000	14,000
	8		8		$183,000

(Assumes 75% attributable to project) $137,250

PROPTA (Atakpame)

8-ton truck	(1)	0	1	$21,000	$21,000
3-ton truck	(0)	1	1	14,000	28,000
Pick-up truck	(3)	2	5	9,000	63,000
Station wagon	(1)	0	1	14,000	14,000
	8		8		$126,000

(Assumes 50% attributable to project) $63,000

Total Vehicle Cost $200,250

III. Construction:

Miscellaneous construction materials
(cement, wood, roofing)

Total Construction Costs $100,000

IV. Other Expenses:

Vehicle maintenance/gasoline/other	$150,250
Vehicle repairs (vehicle cost x 25%)	50,000
Utility installation costs	1,000
Misc. office supplies	10,000
Training: Kara (25,000 x 75%)	18,750
Savanes (25,000 x 75%)	18,750
Atakpame (60,000 x 50%)	30,000
Director's home furnishing	5,000
Total Other Expenses (adjusted)	$283,750

Summary of GOT Contribution

Personnel	$526,152
Vehicles	200,250
Construction	100,000
Other Expenses	283,750
	$1,110,015
Contingency (10%)	111,015
Inflation[1]	448,054
Total GOT Contribution	$1,669,221

[1] Since GOT expenditures will be incurred more evenly over the life-of-project than AID funds, the inflation category is proportionately greater for the GOT than for AID financing.

UNITED STATES GOVERNMENT

10 - 31

memorandum

DATE: July 28, 1982

REPLY TO ATTN OF: John J. Cloutier, Financial Analyst

SUBJECT: Togo Trip Report: July 8 - 22, 1982

TO: Gordon W. Evans, REDSO Director

THRU: Henry S. Holland, Acting Controller

Purpose: This two week trip combined two scheduled TDY's; (1) to work as a design team member on the Togo Animal Traction project paper examining financial management and budgetary issues; (2) to review the USAID Lome project portfolio for local cost composition and to assess the adequasy of host country accounting systems based on criteria for certification established for the SAHEL.

Project Paper Summary: The AID grant of $5 million over a 5 1/2 year project life is budgeted most heavily during the first half of the project obligation schedule. First year spending requirements are disproportionately high as most of the construction is a prerequisite to other project activity and the revolving funds require most of their life of project amounts up front for cash flow purposes. See attachment for a summary of AID and GOT projected expenditures.

The large proportion of local currency expenditures in the AID grant and the specific procedures required for administering revolving funds necessitate careful design and adherence to specific control measures. It is essential that project management include qualified financial management personnel who are aware of AID financial procedures and reporting requirements.

Since Kara is the project headquarters site its staff will include a senior level accountant with several years of experience to serve as the project's overall financial manager. AID will assure that this financial manager be trained in those areas of accounting procedures which are specific to AID and to this project in particular. Among other responsibilities the financial manager will supervise at least one accountant at Kara to maintain day-to-day records, inform the USAID Project Manager and the Project Director of budgetary variances, cash-flow status and control weaknesses when appropriate and comply with all written reporting requirements of the West African

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Accounting Center (WAAC), the fiscal center for USAID Lome. In order to fulfil these requirements the financial manager should receive periodic short-term technical training and assistance by AID and short-term training in Lome early in the first year of the project. Also, during the first year the financial manager should visit WAAC for a thorough briefing on AID accounting procedures and requirements.

The Project Director in Kara will ensure that AID receives project quarterly reports demonstrating by budget line item cumulative disbursement status and budget variances to date. To verify that revolving fund current account balances are sufficient and necessary quarterly reports will include all cash outflows from purchases of animals, equipment and veterinary supplies and all cash inflows from AID deposits, farmer loan repayments and reimbursements for animal purchases for other projects. In order to assess the suitability of the cattle purchasing payment procedures in Dapoang the financial manager will visit the buying station at least monthly to compile a report detailing any non-check (purely cash) transactions and summarizing overall financial activity.

USAID Togo Local Currency Status: In response to Assistant Administrator Ruddy's concern that non-Sahelian posts assess the accounting procedures and controls in those projects where AID financed local currency is involved (as per State 119708), I represented WAAC as the USAID Togo Controller office in performing a review of each projects' accounting system. My review included examination of documentation for advance replenishment and preparation steps of such documentation by host country entities, examination of USAID project financial records and financial monitoring procedures with project managers and an analysis of the extent of local currency by project. The last task included a review of flows of funds, ministries and accounting centers involved and status of local currency funding compared to project budgets.

I found that if certification were to be required at this time, based on those criteria established for the SAHEL, that all USAID Togo projects have adequate accounting systems so as to justify certification. However, to ensure the maintenance of certifiability during the next year AID must follow-up closely those projects where local currency volume is increasing. This entails continuing project manager involvement with and visits to local project management and accounting staff, strengthening reporting requirements to AID in some projects and close monitoring by WAAC of the overall status of local currency funds. These findings and a discussion of the projects which wil require special attention to ensure continuing accounting system adequacy were cabled to AID/W (Lome 4238).

Conclusions: The Togo Animal Project must have both qualified financial management personel and an adequate accounting system in place before AID can disburse funds to establish the revolving funds or begin other project activity. The accounting controls and reporting requirements as written in the project paper are essential for reasonable accountability of the $2.5 million in AID financed local currency funds. Overall, the status of local currency controls in other projects is adequate and areas for improvements were discussed with appropriate USAID and project staff.

cc: Larry Bond, Chief, AFR/DR/CCWAP
Lou Eldredge, Acting DD/TS
James Ito, REDSO Controller
Jim Osborn, PDO
John Lundgren, CAR Togo

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ANNEX ELEVEN: PEACE CORPS PARTICIPATION

ANIMAL TRACTION RESOURCE WORKER (10)

LOCATION: The PCV's will be assigned to Centres d'Appui Technique (CAT's) at locations throughout the Kara and Savanes regions. Currently identified sites include Nampoach, Pagouda, Kante and Warengo (Kara region), and Toago, Gando and Naki Est/Nayega (Savanes Region).

SUPERVISION AND REPORTING: Volunteers will be assigned to the Regional Directorate for Rural Development (Direction Regionale de Developpement Rural) in either the Kara or Savanes regions. They will be supervised by the head of the extension service in each region who will determine reporting requirements in coordination with the director of the northern branch of the national animal traction project and the two regional directors of DRDR.

SCOPE OF WORK: 1. The volunteers will work as counterparts to the sector or subsector extension officers (chef secteur, chef sous-secteur). The sector and subsector officers are responsible for the management of field agents (encadreurs) who work directly with farmers. The assignment of volunteers at the sector and subsector levels is designed to reinforce the operating premise of the TAT project that all technical assistance should be directed towards strengthening existing GOT services rather than creating independent and parallel project structures of doubtful sustainability.

The volunteer's job is probably most accurately characterized as a field-oriented, middle-management position. The volunteer will have extensive contact with farmers. The form of this contact should almost always be collaborative, with active participation by the counterpart chef secteur/sous-secteur or encadreur. The objective of this type of interaction is to increase the capacity of GOT personnel to successfully manage animal traction extension programs.
Achieving this objective will be the major job challenge for volunteers. It may also be the major source of frustration. The challenge will come from the need to acquire, and then transfer, practical animal traction skills and the technical capacity to adapt packages to farmers' needs. Without these skills, volunteers would not be able to lend credible assistance to extension efforts. Frustration may result from the need to carefully balance the acquisition of animal traction skills with the central task of developing counterpart skills in the management of animal traction outreach programs.

2. Volunteers will work in collaboration with DRDR personnel to carry out the following tasks:
   a. identify farmers whose farming operations meet the criteria for animal traction adoption;
   b. deliver draft animals and equipment to farmers;
   c. establish management and administrative procedures at the sector and subsector levels to provide effective supervision

of animal delivery, health follow-up, farmer training, animal nutrition, crop extension, and monitoring and evaluation of extension program impact; and,

d. develop the farm management programs at the Centres d'Appui Technique (CAT's or Technical Support Centers) in the Kara and Savanes regions.

3. Technical backstopping for the animal traction volunteers will be provided by the individuals on the technical assistance team (Project Coordinator/Administrator, Agricultural Economist, Agronomist, and Livestock Specialist) and by GOT technicians.

QUALIFICATIONS: A B.S./B.A. degree in agriculture or an agriculture-related field is highly preferred. At a minimum an A.A./A.S. degree is required. Before arrival in the country, volunteers should receive training in animal traction at a U.S. institution with an established animal traction program (e.g. Sam Houston State University). Part of this pre-service training should also include simple farm management record keeping for livestock and crop enterprises.

After training in Togo, volunteers should have a minimum FSI French rating of S-2+, R-2+. A formal in-service training period for both animal traction and local language instruction should be held after volunteers have been at a post for a few months.

ANIMAL TRACTION TRAINERS (3)

LOCATIONS: The PCVs will be assigned to the national animal traction project's training centers at Agbassa and Kamina in 1982 and at Tantiegou in 1983. The volunteer assigned to Kamina will probably reside in Atakpame. The Agbassa volunteer will reside at the center and the Tantiegou volunteer in Dapaon.

SUPERVISION AND REPORTING: The supervision of the volunteers will be done by representatives of the training division of the national animal traction project. Volunteers will report through the project's regional directorates in Atakpame and Kara to the head of the training division.

SCOPE OF WORK:

1. The volunteers will work with the training division to develop, execute, evaluate and modify animal traction training curricula, materials, and procedures. The major thrust of training will be to introduce government and project staff to the practice of animal traction. Trainees will include village extension agents, extension supervisors, students from the national agricultural training institute at Tove and the University of Benin, and middle and upper-level staff from the concerned ministries. Limited amounts of farmer training may also take place at the three training centers.

2. The PCVs will assist their GOT counterparts and supervisory staff in the development of training programs in the following subject groupings:
   - large animal husbandry,
   - animal health,
   - animal traction equipment use, maintenance and repair,
   - forage crop production and conservation,
   - agricultural credit,
   - agricultural extension techniques,
   - agricultural extension supervisors,
   - animal traction program management and administration,
   - data collection and analysis,
   - program monitoring and evaluation.

   The above list should be taken as indicative. Much more detailed program specifications will be carried out by the training division.

3. Volunteers will work and co-ordinate their programs with a wide variety of organizations and individuals, principally those in agricultural institutions and projects active in Togo. The volunteers will obtain subject matter guidance from the Technical Assistants in project co-ordinators,

agricultural economies, organizing and livestock science funded by AID, as well as technicians from national institutions and field services.

QUALIFICATIONS:

1. Due to the training subject matter a minimum A.A. or A.S. degree in an agricultural field is recommended, with a B.A. or B.S. preferred. Experience with the 4-H, FFA, or farm clubs at the leadership level would be highly valuable.

2. Strong communication skills are needed. After training, a solid S-2+, R-2+ FSI score in French is required with S-3, R-3 preferred. Additional in-service French training is recommended after several months working experience.

CATTLE BUYER (1)

LOCATION: The PCV will reside in Dapaon, the regional capital of the Savanes Region. The major work sites will be the Tantiegou buying station, Toaga holding corral, and the regional Animal Health Service in Dapaon. Frequent travel throughout the Savanes and Kara regions will be necessary.

SUPERVISION AND REPORTING: The volunteer will be assigned to the national animal traction project scheduled to be created by the Togolese government in late 1982. The supervising officer for the volunteer will be the northern regional director of the GOT project. Reporting requirements will be established by the northern regional director or his delegate.

SCOPE OF WORK:

1. The initial task of the volunteer Cattle Buyer will be to identify sources of supply for up to 2,000 head per year of draft animals. These animals are destined for distribution to all projects working with animal traction in Togo.

   The current PCV has already established good lines to local suppliers in the Dapaon area. The new volunteer will have to maintain these links and expand them through contacts with merchants, transhumant pastoralists, and sedentary herders.

   Depending on the initial results of this work, it may be necessary for the volunteer to work with GOT officials to establish contacts with suppliers in Upper Volta, Benin and Ghana.

2. The development of an adequate supply of animals requires an efficient buying organization that is trusted by suppliers. Working with project staff members, the PCV will be a central figure in the organization of procedures for price negotiation, inspection, tagging, purchase, reception, and delivery of animals to the national project's buying center at Tantiegou.

   Currently all purchases are made in cash upon delivery of animals. As the volume of purchases will increase greatly in the near term, a crucial task will be the establishment of orderly payment procedures. The PCV will work with project staff to set up payment procedures with the regional office of CNCA (Caisse Nationale de Credit Agricole--the national agricultural credit bank), in Dapaon.

3. As animals will be obtained from a wide variety of sources, their health status will vary considerably. As soon as possible after purchase, cattle will be treated against internal and external parasites, sleeping sickness, and endemic diseases (anthrax, bovine pleuropneumonia, rinderpest, blackleg, etc.), if necessary. To ensure this treatment, the PCV will work with project staff and the Animal Health Service (Sante Animale) to establish standard operating procedures for initial inspection and handling.

4. One of the major purposes of the Togo Animal Traction Development (TAT) Project is to help create viable animal traction services. The development of project staff capabilities in animal supply organization, financial arrangements for purchases and initial health treatments will be a central focus for the volunteer. The volunteer is expected to help staff move from the level of apprentice cattle buyers to individuals who can manage the buying operations with a minimum of supervision.

5. To ensure adequate technical backstopping, the volunteer will coordinate buying activities with the Livestock Specialist assigned to the Tantiegou buying station under the TAT project

QUALIFICATIONS:

1. The volunteer will need a mature, strong character to operate effectively in a trading environment where thousands of animals and up to $500,000 will change hands annually. While cash transactions will be handled through arrangements with CNCA, the potential for abuse exists. Personal integrity is a must for this position.

2. A B.A. or B.S. degree is preferred for this job with an A.A. or A.S. as a minimum standard. Training and/or experience in business skills, farm record keeping or bookkeeping is highly desirable. A ranch or farm background is highly recommended.

3. Language skills. The PCV should have strong French reading and writing skills (FSI S-2+, R-2+) after training. Local language training arrangements should be made as early as possible in the volunteer's tour of duty--fluency in the local tongue will be an invaluable addition to his many required skills.

CONSTRUCTION SPECIALIST (1)

LOCATION: The volunteer will reside principally in Kara but will be required to undertake extensive overnight travel at construction and renovation sites throughout the Kara and Savanes regions.

SUPERVISION AND REPORTING: The PCV will be assigned to the Rural Works Service (Genie Rural - G.R.) of the Kara and Savanes region. Supervision will be done by the head of the service after a plan of work is established with the assistance of the regional director of the AID funded animal traction extension program. Reporting requirements will be determined by the head of G.R.

SCOPE OF WORK:

1. The PCV will work with G.R. staff to construct animal handling facilities at five new animal traction support centers (Centre d'Appui Technique-CAT) in Kara and Savanes regions.

2. In addition to new construction, the PCV will work with G.R. staff to renovate five existing CATs in the Kara and Savanes regions.

3. In line with the purpose of the Togo Animal Traction Development Project (TAT), to work with and strengthen existing services, the volunteer will help establish management and administration services for commodity procurement, delivery, and distribution as well as construction supervision. The PCV will be aided in these efforts by the Project Coordinator for (TAT) and engineers from REDSO/WA.

QUALIFICATIONS:

1. A B.S. in Civil Engineering with some construction experience is preferred. An A.A./A.S. degree in construction design or basic engineering is a minimum requirement. Construction experience is desirable. Peace Corps should provide the recruit with training in basic tropical construction designs and techniques before post assignment. Cement and cement mixes, foundation, wall and roof construction, drainage and sanitary structures, carpentry, and metal work should be covered. Besides having a personal familiarity with basic masonry and carpentry practices used in Togo, the volunteer should be able to work with Togolese skilled workers in the field and with engineers in more formal settings

2. A minimum FSI French rating of S-2+, R-2+ is required.

GRAPHICS AND AUDIO-VISUAL SPECIALIST (1)

LOCATION: The PCV will reside in Atakpame, the capital town for the Plateaux Region and headquarters for the national animal traction project.

SUPERVISION AND REPORTING: The volunteer will be assigned to the training division of the national project in 1984. The head of the division will supervise the volunteer's work and establish reporting requirements.

SCOPE OF WORK: Following-up the initial training experiences of the wide variety of development projects and services which extend animal traction technology, the volunteer will design graphics and audio-visual materials for use in animal traction training programs. These materials will be used to standardize the instruction of animal traction technology. Tasks include the following:

1. Participation in the annual revision of the Memento de la Culture Attelee (Animal Traction Handbook) including handbook layout and design, preparation of pen and ink illustrations, and preparation for large volume job printing;

2. Development of instructional aids (printed, photographic and audio) for the training centers; and

3. Development of extension aids for use by field services;

4. Assure that graphic training materials to be standardized and distributed nationally, cover all major areas of concern related to animal traction: equipment, credit, health care, etc.

QUALIFICATIONS:

1. A B.A./B.S. in a communications or graphic arts field with training and experience in design and production of graphics and audio-visual materials is preferred. Past experience with agricultural training and/or extension materials is desirable.

2. By the end of training, a minimum FSI score of S-2+, R-2+ in French is required.

3. In the recent past, PCVs have worked in similar fields in West Africa (the Gambia, Mali, Niger). PC may have qualified candidates for the proposed position already serving in West Africa.

RECOMMENDED PCV SITE SELECTION

1982-84

TOGO ANIMAL TRACTION	POSITION
1. KAMINA	TRAINER
2. AGBASSA	TRAINER
3. TANTIEGOU/DAPAON	CATTLE BUYER
4. NAMPOACH	ANTRAC EXTENSION
5. WARENGO	ANTRAC EXTENSION
6. GANDO	ANTRAC EXTENSION
7. TOAGA	ANTRAC EXTENSION
8. KAGNISSI/PAGOUDA	ANTRAC EXTENSION
9. KANTE	ANTRAC EXTENSION

PROJET VIVRIER	POSITION
10. ATCHANGBADE/SIRKA	ANTRAC EXTENSION

CONTINGENCY PLANS:

A. If only nine volunteers are available, the Kante position would be dropped.
B. If only eight volunteers are available, (A) would occur and the Kagnissi/ Pagouda position would be dropped.
C. If only seven volunteers are available, (A) and (B) would occur and Projet Vivrier would be dropped.

1983-85

TOGO ANIMAL TRACTION	POSITION
1. LAMA KARA	CONSTRUCTION
2. TANTIEGOU	TRAINER
3. NAKI EST/NAYEGA	ANTRAC EXTENSION
4. BOGOU SITE TO BE DETERMINED	ANTRAC EXTENSION
5. SITE TO BE DETERMINED	ANTRAC EXTENSION
6. SITE TO BE DETERMINED	ANTRAC EXTENSION

RECOMMENDED PCV SITE SELECTION

1984-86

TOGO ANIMAL TRACTION	POSITION
1. KAMINA	TRAINER
2. AGBASSA	TRAINER
3. TANTIEGOU/DAPAON	CATTLE BUYER
4. NAMPOACH	ANTRAC EXTENSION
5. WARENGO	ANTRAC EXTENSION
6. GANDO	ANTRAC EXTENSION
7. TOAGA	ANTRAC EXTENSION
8. KAGNISSI/PAGOUDA	ANTRAC EXTENSION
9. KANTE	ANTRAC EXTENSION
10. ATAKPAME	GRAPHICS/AUDIOVISUAL MATERIALS

1985-87

1. TANTIEGOU	TRAINER
2. NAKI EST/NAYEGA	ANTRAC EXTENSION
3. BOGOU SITE TO BE DETERMINED	ANTRAC EXTENSION
4. SITE TO BE DETERMINED	ANTRAC EXTENSION
5. SITE TO BE DETERMINED	ANTRAC EXTENSION

1986-88

1. KAMINA	TRAINER
2. AGBASSA	TRAINER
3. TANTIEGOU/DAPAON	CATTLE BUYER
4. NAMPOACH	ANTRAC EXTENSION
5. WARENGO	ANTRAC EXTENSION
6. GANDO	ANTRAC EXTENSION
7. TOAGA	ANTRAC EXTENSION
8. KAGNISSI/PAGOUDA	ANTRAC EXTENSION
9. KANTE	ANTRAC EXTENSION
10. ATAKPAME	GRAPHICS/AUDIOVISUAL MATERIALS

ANNEX TWELVE

MONITORING AND EVALUATION

INTRODUCTION

The importation of an explicit monitoring and evaluation unit (M&E) in the design of an implementation project is somewhat particular to AID design methodology. Of the more than 20 animal traction projects in Togo, none make systematic attempt to monitor the impacts of project activities. Only the World Bank assisted cotton project, SOTOCO, makes any attempt to follow project activities,but is limited to notebooks kept by extension agents themselves and then they only carefully monitor fields.

On the other hand, the GOT readily recognizes the necessity for such an ongoing activity and feels that American technical expertise represents the best if not the only reliable source of assistance in organizing and conducting such an activity. The Ministry of Plan, responsable for coordinating foreign aid, has recently created an M&E unit primarily staffed with young technicians trained under AID auspices in the United States. Also, the Agricultural Statistics Service conducts sample surveys based on the 10-year agricultural census each year in an attempt to monitor changes in cropping patterns, areas cultivated, yields and productions.

The intention of an M&E unit is to monitor the impacts of project activities, evaluate their effectiveness and provide analyses to be used as a basis for modifying unsatisfactory project activities. Perhaps the most important requirements of such and M&E unit are cost minimization and quick turnaround time from information gathering to analysis to recommendations. As an implementation project, it is not possible to adapt information requirements and decision criteria used in a formal research program. They cost too much and take too much time from question to answer.

OBJECTIVES

As in the TAT project in general, the M&E unit's objectives are stared at different levels and concerned with a range of topics. The TAT supported M&E unit does not pretend to do everything for everybody, but will rely on GOT M&E ongoing activities and, through PROPTA, promote the inclusion of M&E units in all implementation projects.

The functional organization of PROPTA will include a TAT supported M&E cell. This cell will be responsible for developing methodologies to monitor changes in farm-level economics, to evaluate the effectiveness of different project strategies in promoting animal traction, and to monitor changes in the use of natural resources. It is not intended that this M&E cell conduct all these monitoring activities. As the monitoring information is compiled, the M&E cell will be responsable for its analysis and presenting the analysis and resulting recommendations to COCA.

In so far as TAT is concerned, the M&E cell will be expected to implement the on-farm monitoring and analysis of the economics of animal traction in those areas where TAT is supporting extension activities. It will also be called upon to evaluate project effectiveness as a whole with particular reference to comparative capital intensity among other animal traction projects. As part of its monitoring activities, the M&E cell will also keep track of changes in resource use patterns, in particular land and labor.

As a functional component of PROPTA, the M&E unit's objective is one of promoting the necessity of such an activity as an integral component of all animal traction projects and developing methodologies with which such activities can be implemented by the various projects. As a functional component of the TAT project, the M&E unit's objective is to execute the monitoring and evaluation activities within the context of the TAT project.

INFORMATION NEEDS

It would be premature to specify information needs as part of a project design exercise. This is more properly entrusted to the implementation team. However, some general indications can be presented which help demonstrate the differences between an M&E unit in an implementation project and a more general research investigation.

1. Farm-Level Economics: The objective is first to get a fairly representative picture of farm-level economics and then to track changes in farm-level economics and their relationship to the introduction and use of animal traction. In order to do this, it will be necessary to describe the farm enterprise and its mix of activities, to monitor the nature and use of production inputs (including animal traction) and to evaluate yields, production and incomes.

2. Project Effectiveness: Here, the objective is to monitor the impact of project strategies and their costs. It will be necessary to monitor a set of indicators of project impact (number of adopters, area cultivated, credit repayment rates, etc.) and to monitor the cost of various project

sub-activities. It will also be necessary to determine a set of indicators which provide a basis for cross-project comparisons (i.e. capital intensity).

3. Resource Use: In this instance, with so many projects promoting animal traction in Togo and with national policy having placed a priority on the expansion of animal traction throughout the country, the aggregate impacts on the resource base are important to policy considerations. It will be necessary to monitor land use, allocation of labor, land clearing, national herd composition, etc. The objective is to be able to estimate the aggregate impacts of moving towards an agricultural system based on the use of animal traction on the natural resource base.

4. Assumptions: Throughout the development of this project design, a range of assumptions have been made with are critical to the predicted impact of project impact activities. The M&E unit can provide valiable input to the formal evaluations (both internal and external) of TAT. It is fairly rare that evaluations of implementation projects return to the original analyses and assumptions in the design document to rerun those analyses. The TAT M&E unit will be expected to monitor the assumptions made in this design document (for example: yields, prices and rural-urban terms of trade) such that the formal evaluation exercises will be in a position to legitimately compare before, during and after analyses.

METHODOLOGY

Here again, the design document should not specify methodologies to be used for monitoring and evaluation services. This discussion is intended to present orientations and possible areas of collaboration with other institutions. As stated earlier, the key characteristics of an effective M&E activity are cost-effectiveness and quick turnaround time. It is the choice of methodology that most directly influences these two objectives.

There is no doubt that in preparing an M&E program of work, the selection of questions to be asked is of extreme importance. If a question is not carefully and clearly stated, it is very difficult to generate a clear answer. However, in many cases similar concern is often not given to clearly identifying the clients nor to what methodology is necessary to get the data required to adequately answer those questions. There are the very concerns which can multiply cost factors geometrically. As an example, if one is trying to quantify a learning function in relation to the use of animal traction and the question is put to all animal traction farmers whether or not they weed with their animals, this would generate a large volume of data, would consume time and would not, necessarily,

answer the question. However, if it were previously known how long various farmers had been using animal traction and who had weeding implements, a much more restructed sample could be drawn and data generated would reply more directly to the question.

In M&E activities, the need to devote serious thought and time to preparing the activity before even going into the field can not be overemphasized. A premature rush to gather data will increase costs, lengthen turnaround time and very likely not answer the questions or instead answer questions concerning clients with whom one is not concerned. The notebook currently used by the World Bank cotton project has this failing. In this notebook, a basic inventory of the farm and the farm family is kept and then, for the cotton fields, all input/output data is recorded. It is not apparent that anyone has specified a set of issues to address but rather simply has gone out to collect anything and everything and then later has seen what could be with it. One observes large stacks of these notbooks sitting on the floor in various offices. Such a methodology is not only expensive but also consumes a great deal of time to produce analyses, regardless of whether or not these analyses address any real issues.

An integral component of this M&E activity will be not only the necessity on a cost basis but also the desirability, on a policy basis, to collaborate with other ongoing programs and projects in Togo. In particular, the M&E unit should work closely with the Agricultural Statistics Service, with the M&E unit in the Ministry of Plan, and through PROPTA, with other donor-assisted animal traction projects.

The first general agricultural census was taken in 1972-73 and is being repeated in 1982. During the interim years, a more modest agricultural survey was repeated each year. The Agricultural Statistics Service is relatively well equipped, both in trained manpower and data manipulation capcity. The biggest problem they have is a very poorly defined sampling methodology. Among other things, it is unclear who the sample represents and this makes it difficult to quickly respond to even the most basic question (for example, average farm size).

The Service uses a two-step sampling technique beginning with a list of all villages and towns. A random choice is drawn. For towns over 5,000 residents they are divided into neighborhoods which have the same status as a village. Within the list of villages drawn, a choice of households is drawn randomly. A total of 3,500 households are used of the 10-year census while a sub-sample of approximately 700 is used for the annual surveys. It is acknowledged that the Agricultural Statistics Service is attempting to say something about the agricultural sector in general, but even at this macro-level it is doubtful that such a sampling methodology would generate an accurate representation. For one thing, large population concentration are over-represented and the influence of population density appears to have been factored out.

This discussion is not intended to belittle the Agricultural Statistics Service. On the contrary, they have a data collector program and infrastructure in place. They have voiced strong interest in access to any technical expertise TAT might be able to offer. They have no problem in making some of their unused computer capacity available. They are willing to adjust their questionnaire forms to incorporate references to animal traction. Coming out of the 1982 general agricultural census, they are willing to reexamine their sampling methodology for the animal survey exercises. The TAT M&E unit will work closely with the Agricultural Statistics Service and attempt to develop a joint program whereby the more general descriptive information on smallholder agriculture can be generated by the Agricultural Statistics Service and the M&E unit can develop techniques to specific issues and questions.

The M&E unit in the Ministry of Plan is just getting underway and for the time being is simply taking inventory of developed activities in the country. Given the well-trained (though inexperienced) staff of this unit, the TAT M&E unit should maintain regular interaction with Plan, advise them regarding methodologies and analyses, and if possible, use staff members in carrying out data collection and analysis activities. The Ministry of Plan is most interested in comparing project performance across projects as an input into defining development policy and relationships between the GOT and external sources of development assistance. Given the national animal traction policy and the large number of animal traction projects, this orientation coincides nicely with one of the major concerns of the PROPTA M&E unit.

STRATEGY

The incorporation of an M&E activity into an implmentation project is a new idea in the Togolese environment. It will be necessary for this TAT M&E activity to prove its effectiveness and usefulness. Consequently, the development of an M&E program will occur in phases. Upon the arrival of the technical assistance team,careful preparatory work will have to be done not only on specifying appropriate methodologies and on clearly describing the clients, but most importantly, on choosing the first set of questions to be investigated. It will be necessary to choose topics of direct and immediate concern to the GOT and to other projects.

Such topics might be the financial parameters to medium-term credit programs, or the need and/or impacts of input price subsidies. As the M&E unit begins to demonstrate that its methodologies are capable of generating useful analyses and recommendations in relatively short order, it then becomes progressively feasible to persuade other projects to initiate similar activities on the one hand and to begin broadening the subject matters to be monitored and evaluated on the other.

The design team feels that this concern for building legitimacy is very important to the M&E unit's objective. Within the TAT project, the M&E unit has automatic legitimacy in that it represents a specific requirement of the donor. However, this M&E unit is also a functional component of PROPTA and as such is expected to work with all animal traction projects in Togo. Even more sensitive or challenging is the fact that PROPTA's M&E unit will be expected to evaluate these projects and the various donor strategies. A M&E unit's objective is to improve project performance. In order to do this, it must have credibility in the minds of project implementors. Basic to creating the credibility will be the demonstrated ability to respond quickly, effectively and cheaply to the concerns and problems faced by project implementors.

ANNEX THIRTEEN JOB DESCRIPTION

INTERIM PROJECT COORDINATOR

LOCATION:

The Interim Project Coordinator will reside in Kara, the capital of the Kara region, and site of the northern offices of PROPTA, the National Animal Traction Project. The principal work site will be the present offices of the AID-funded animal traction AIP project in Kara. The Interim Project Coordinator will have extensive responsibilities across the length and breadth of the country in carrying out first-year project implementation activities in preparation for the arrival of the regular technical assistance team, scheduled for September 1983. He/She may be on the road up to 10 days per month.

REPORTING ARRANGEMENTS:

The Interim Project Coordinator will advise and report to the Project Director who is the northern coordinator for regional animal traction activities. He/She will have direct and continuous contact with the AID Project Manager at OAR/Lome in the implementation of initial actions to be undertaken under the TAT project. He/She will eventually cede all authority and responsibility to the Project Coordinator, upon his/her arrival.

SCOPE OF WORK:

1. CLOSE-OUT OF PRESENT ANIMAL TRACTION ACCELERATED IMPACT PROGRAM (AIP)

The first responsibility of the Interim Project Coordinator will be to draw together and conclude the activities under the AID-funded AIP project. The Project Activity Completion Date of this project was extended from June 30 to December 30, 1982 to permit the completion of construction which had suffered a late start, and to provide funds for operational costs during the interim period, before AID-funds under TAT can be made available in first-quarter FY 83. His/Her responsibilities will be doubled in that the regular Project Director will be absent from 9/82 - 6/83 for long-term training in France.

- Work with the Interim Project Director (the Director of Kara region DRDR) in drawing up a list of priority expenditures to be incurred under the AIP before the PACD.
- Oversee the completion of construction at the center in Agbassa. Make final reception and settle all outstanding accounts.
- Maintain necessary office operations in Kara, including monthly progress and financial reporting, disbursement of petty cash and maintenance of vehicle fleet.
- Make out an end-of-project status report, with particular reference to goals and purpose of the project agreement, and responding to the concerns set forth in the project summary evaluation.

2. CONTINUATION OF ANIMAL TRACTION FARM EXTENSION ACTIVITIES

With the arrival of a new group of ten Peace Corps volunteers (due to be sworn in o/a Sept. 20, 1982), there will be a lot of preliminary work to be done by the Interim Project Coordinator in assigning farm extension responsibilities for the 1983 agricultural campaign. These include (but are not limited to):

- Assuring the regular flow of cash for animals to the cattle buying operations in the Dapaon area.
- Assisting each new volunteer involved in field extension (7) to draw up:
  a) a plan of work in his area that will help to cover services to existing farmer-adopters, and
  b) a plan of work that will open up opportunities for placement of new animal traction units in 1982-83.
- Laying out training requirements for extension, ag credit and veterinary agents for this coming season. Working out training schedules with the two new volunteers in charge of working up and overseeing regional training programs.
- Coordinating cattle purchase orders which are received from other projects in Togo; arranging for deliveries.
- Taking equipment deliveries and making distribution of units that will be required by AID-funded on-going operations through the 1982-83 season.

3. PREPARATIONS FOR IMPLEMENTATION PHASE OF TAT (to begin in September 1983)

The primary role of the Interim Project Coordinator is to supervise the putting into place of the various TAT project components that will be required during the implementation phase, to begin upon the arrival of the Technical Assistance Team in September 1983. In order to accomplish this task, the Interim Project Coordinator will have to:

- Play a major role in the design, awarding of contracts and supervision of the project-related construction that will be contracted to Togolese-based enterprises.
- Initiate, oversee, and make recommendations in the implementation of a series of animal traction training modules which are to be developed under TAT. This includes supervision of training personnel assigned to the project (volunteers and nationals) and a solicitation of the felt training needs of other animal traction projects which request assistance. It also involves vigilence in the incorporation of sound technical expertise into all training materials.
- Initiate, oversee and make recommendations for the improvement of a simple method of tracking project inputs and outputs, in preparation for a long-term concentrated program of monitoring and evaluation.
- Initiate, oversee and make improvements, as required, in a comprehensive system of project financial accounting that can be put into place in Kara and Dapaon. It should respond to the needs of the project and

follow guidelines which are layed-out by standard, acceptable AID accounting procedures for local currency disbursements.

- Assist in drawing up a final list of technical specifications and probable sources for commodities which are to be procured under the project and which must be ordered within the transition phase.
- Assist in the organization of the receipt, in-country transportation and distribution or storage of project commodities, including vehicles.
- Personally take charge of making arrangements for the arrival and accomodation of four long-term members of the Technical Assistance Team. This includes selection, leasing and arranging for the preparation of housing, contracting for the local fabrication of furniture, and the receipt and installation or storage of household and personal effects.
- Participate in an evaluation of the transition phase, to be carried out with members of the Technical Assistance Team in conjunction with handing over Project Coordinator responsibilities to the long-term replacement.
- Coordinate TAT project activities with other AID country projects and with other animal traction projects funded by other donors, banking institutions and private/voluntary organizations.
- Work with the national Project Director (or his interim) in explaining the process and procedures of TAT project implementation according to AID regulations.
- Act as the primary contact point between AID and Peace Corps volunteers assigned to TAT.

QUALIFICATIONS:

The Interim Project Coordinator must be willing and enthusiastic about dealing on a day-to-day basis with a broad range of Togolese staff and counterparts, European members of development assistance programs, and American technicians, administrators and volunteers.

He/She should preferably have a bachelor's degree in Public Administration or Business Management or a related field. He/She should have a recent history of extended practical, field experience in the organization and operation of an important development assistance program in the Third World.

Ideally, he/she should have experience in rural, farm settings and have a working knowledge of farm systems, specifically those which predominate in West Africa.

The person who is selected for this position must have FSI certified speaking and reading skills at the S-3 and R-3 levels in French.

JOB DESCRIPTION

FACILITATOR

LOCATION:

The TAT Project Facilitator will literally have no permanent residence, although for the record, Kara will be considered as it. The many and varied responsibilities of the Project Facilitator will oblige him/her to be very mobile, to pass considerable time on the road, and to spend extended periods of time (up to 2 weeks) in places like Dapaon, Lome or Warengo. Field work under rudimentary conditions will be the rule.

REPORTING ARRANGEMENTS:

The Project Facilitator will report directly for his/her assignments to the TAT Interim Project Coordinator.

SCOPE OF WORK:

The Project Facilitator is to perform his/her tasks in such a way that the program set out for the transition phase is successful in laying all preparatory work for the project implementation phase which is scheduled to begin in September 1983. In order to accomplish his/her tasks, the Project Facilitator will be called upon to carry out the following assignments:

- Keep constant checks on the progress and quality of both contract and in-house (Peace Corps and GOT workers) construction under the project.
- Handle the arrangements for port (air and sea) reception, customs clearance and in-country transport or storage for all project imported commodities and the household and personal effects of members of the project Technical Assistance Team.
- Handle local procurement of commodities (office supplies, gasoline coupons, etc.) to be procured under the project, including making necessary preliminary contacts for leasing of housing, fabrication of furniture, etc.
- Handle the reception and registration of project vehicles, and help to set up a regular program of project controlled maintenance and repair (with project assigned and trained mechanics).
- Coordinate, with the responsible Associate Peace Corps Director, the settling-in to post of Peace Corps volunteers assigned to the project, including handling matters relating to motorcycle operations and maintenance, and establishing a regular schedule of logistical backstopping and material support - as related to project-related activities.
- Relate to other animal traction projects in the TAT project zone, as needed, in order to build up a spirit and practice of cooperation and mutual support. In this respect, the Project Facilitator serves as a lower-level catalyst

of antrac-type projects around the central pole of PROPTA.

- Perform (or have performed) all other various and sundry sorts of assignments that the Interim Project Coordinator may deem reasonable in order to meet the implementation plan in time for full operations by September 1983.

QUALIFICATIONS:

The Project Facilitator should have the capacity, physical and mental, to work tirelessly, doggedly and with a good spirit. He/She must be able to handle a variety of tasks, in inter-action with an assortment of many personalities, to achieve objectives which may give very little personal satisfaction.

He/She should have "African-smarts", gained from extensive field experience up-country in West Africa. He/She should be able to demonstrate from experience a history of being able to deal with middle-level government officials, merchants, landlords and transporters. He/She should have a record of close and aimable contacts with such diverse parties as Togolese management, European technicians, Peace Corps volunteers and African common and skilled laborers and farmers.

The person selected for this position must have a FSI rated speaking and reading ability in French at the 2+ level.

JOB DESCRIPTION

PROJECT COORDINATOR

LOCATION:

The Project Coordinator will reside in Kara. He/She will have the occasion to make periodic inspection visits to TAT project sites in the northern regions, and have regular encounters on project matters with PROPTA in Atakpame and COCA in Lome. The Project Coordinator will spend a good part of his/her time in making visits to the managerial units of other animal traction projects in Togo. Road conditions are not always optimal, housing away from Kara can be difficult, and on-the-road working conditions are arduous.

REPORTING ARRANGEMENTS:

The Project Coordinator will advise and report to the Project Director (or his interim), who is the northern coordinator for the GOT regional animal traction program (PROPTA). He/She will maintain direct, close and continuous contact with the AID Project Manager at OAR/Lome in the implementation of the TAT project. He/She will assume the responsibilities of the Interim Project Coordinator on a mutually agreed upon date.

He/She will also be responsible to the headquarters of the contract Technical Assistance Team for overseeing the execution of the terms of the T.A. contract, (presuming that all T.A. team members are contracted from the same consulting firm).

SCOPE OF WORK:

1. <u>COORDINATION OF PROJECT INPUTS</u>

The primary responsibility of the Project Coordinator will be to work as the head of the Technical Assistance Team, within the Project Management Unit (which also includes the Project Director) to help ensure the timely, appropriate and efficient delivery of AID-funded inputs. The Project Coordinator will look for opportunities to improve the implementation of the animal traction program, as outlined in this PP, so as to enhance the chance of progress made towards achievement of project purposes. In order to meet this responsibility, he/she will have to:

- Closely coordinate the technical inputs of the separate members of the the Technical Assistance Team so that while each party may have a specific field of concern, a focus is kept on central project objectives.
- Draw together the training requirements as evidenced in the various fields, and work out, in liaison with training officers of the various animal traction projects, a series of training programs which can use training modules, developed in part by the TAT Monitoring and Evaluation Unit.

- Oversee any required project procurement from U.S. sources; oversee the reception, up-country shipment, and delivery or storage of project commodities.
- Oversee the organization of a program of maintenance and repair of existing project vehicles and the reception and putting into service of additional (or replacement vehicles); oversee the operation of vehicles according to a sound logistical program.
- Oversee construction under the project, including:
  - contracting (where necessary),
  - arranging for in-house (DRDR and Peace Corps) construction,
  - periodic progress checks,
  - reception of finished sites,
  - maintenance of property.

2. BACKSTOP ARRANGEMENTS FOR TECHNICAL ASSISTANCE TEAM

This PP recommends that the four-person, long-term Technical Assistance Team for the AID TAT project be arranged through a single contractor. The Project Coordinator will serve as the principal liaison between the team and the contractor, and between the team and AID in Lome. The Project Coordinator will be considered as the Chief of Party. In this position, in addition to fulfilling certain specific obligations to the contractor in the execution of the contract with AID, the Project Coordinator will also be responsible for:

- Organizing and maintaining all reasonable arrangements for the leasing, equiping, furnishing and up-keep of suitable housing for the Technical Assistance Team.
- Organizing, in collaboration with OAR/Lome, the various rights and privileges of the Technical Assistance Team (and their families) within the administrative structure of the American Embassy community in Togo.
- Organizing, in collaboration with the Project Director and OAR/Lome, a schedule of leave and absences of T.A. personnel that ensures efficient and maximum use of their inputs.

3. PROJECT OPERATIONS

While the Project Director is ultimately responsible for both the long-term project planning and for the day-to-day implementation of the TAT program, AID project management guidelines recommend the close involvement of Technical Assistance, particularly in matters related to financial operations. The Project Coordinator will:

- Assist in the establishment of sound, regular and informative financial procedures, approved by AID. He/She will work closely with the AID Project Manager (OAR/Lome) in ensuring that adequate measures are taken (i.e. training, control of disbursements, organization of petty cash, financial reporting) to guarantee the fiscal integrity of the project.

4. INSTITUTIONALIZATION OF ANIMAL TRACTION

One of the primary objectives of TAT is to begin the process whereby access to the tools (and knowledge) of improved farm management eventually becomes an integral part of the rural farming system in Togo. The Project Coordinator, as the Chief of Party, will be called upon to:

- Co-represent (along with the Project Director and the AID Representative, or his/her designee) TAT on the National Animal Traction Coordinating Committee for the formulation of official policy on matters related to animal traction.
- Advise the TAT Project Director in project implementation.
- Advise the Director of PROPTA in the coordination of TAT project activities within the national animal traction program structure.
- Advise the Directors of the DRDR's of the Kara and the Savanes regions in the planning for and actual implementation of regional animal traction activities, particularly in coordination with other donor imputs to the same region.
- Coordinate AID TAT project inputs, with animal traction programs sponsored by other donor organizations in Togo.
- Coordinate, along with the Project Director and the AID Program Manager (OAR/Lome),
  a) the possible inputs to TAT on the part of private and voluntary organizations (such as Peace Corps) and,
  b) the possible TAT inputs to the animal traction programs of PVO's.
- Coordinate and exchange project information with animal traction-related activities and expertise outside of Togo.

QUALIFICATIONS:

The Project Coordinator must be willing and enthusiastic about dealing on a day-to-day basis with a broad range of Togolese staff and counterparts, European members of development assistance programs, and American technicians, administrators and volunteers.

He/She should have a bachelor's (and preferably a master's) degree in Public Administration or Business Management or a related field. He/She should have a recent history of extended practical, field experience in the organization and operation of an important development assistance program.

Ideally, he/she should have experience in rural, farm settings and have a working knowledge of farm systems, specifically those which predominate in West Africa.

The person who is selected for this position must have FSI certified speaking and reading skills at the S-3 and the R-3 levels in French.

JOB DESCRIPTION

AGRICULTURAL ECONOMIST

LOCATION:

The agricultural economist will reside in Atakpame, the capital of the Plateaux region, and site of the headquarters of PROPTA, the National Animal Traction Project. The principal work site will be within PROPTA's offices, next to the SOTOCO national office, on the outskirts of Atakpame. While at least 70% of the agricultural economist's time may be spent in Atakpame and Lome, the national capital, he/she will be expected to give considerable technical assistance to the animal traction extension support activities in the two northern regions, Kara and Savanes. He/She will be expected to travel extensively throughout the country (approximately 10 days per month). Field work under rudimentary conditions will be necessary.

REPORTING ARRANGEMENTS:

The agricultural economist will report to the Director of PROPTA as the head of the PROPTA Monitoring and Evaluation Unit and with major advisory responsibilities within the Credit and Training Units. He/She will be assigned specific responsibilities within the outlines of the statement of work, which will require him/her to act as technical and policy advisor to the national Animal Traction Coordinating Committee (COCA), to the extension activities of the regional development organizations (DRDR - with a particular accent on the activities of TAT in the Kara and Savanes regions), and to the directional units of the other animal traction projects in-country. He/She will be a member of the project Technical Assistance Team.

SCOPE OF WORK:

1. MONITORING AND EVALUATION

The agricultural economist will participate in the establishment of a data collection, analysis and interpretation process. He/She will use the output of this data process to initiate and maintain a continuing evaluation of the economic feasibility of alternative production strategies using animal traction based on real farm-level conditions in Togo.

2. CREDIT

The agricultural economist will determine parameters to the financial packaging requirements for smallholder animal traction and production credit based on the analysis of debt carrying capacity and ability to repay. He/She will also monitor the performance of credit programs, evaluating repayment rates and analyzing reasons for non-payment.

3. POLICY

The agricultural economist will make major inputs into the progressive formulation of national animal traction policy and its implementation with GOT institutions and donor-assisted projects. This will entail extensive interaction with COCA, GOT ministries, other donors and other animal traction projects.

4. DRDR's

The agricultural economist will be available to the two northern DRDR's animal traction extension programs as a technical resource. He/She will provide farm management counseling and training to DRDR field staff.

5. OTHER TEAM MEMBERS

The agricultural economist will collaborate with the other AID-TAT technical assistants in developing a range of options in livestock and crop management and assessing their economic viability. As an outgrowth of the preceeding evaluations, he/she will participate in specifying equipment packages and their use, based on assessment of alternative viable livestock and cropping packages.

6. TRAINING

The agricultural economist will assist the training cell within PROPTA in developing training programs for extension agents, veterinary agents and loan officers. He/She will also be responsible for assisting individual projects in implementing the training programs.

QUALIFICATIONS:

The agricultural economist will have, at minimum a M.S. in Agricultural Economics. He/She should have specialization fields in production economics and farm management.

The agricultural economist should have a minimum of 4 years of overseas experience in developing countries, preferably in Africa. He/She should have first-hand knowledge of animal traction production systems at the farm level. He/She should have experience in designing and implementing programs of data collection, interpretation and analysis in a Third World context.

Given that a major aspect of the agricultural economist's work will involve extensive interactions with GOT institutions and other donors, he/she will have to have a minimum speaking, reading and writing ability of 3 on the FSI scale. These language skills should be verified as part of the recruitment process. French is the required working language.

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JOB DESCRIPTION

AGRONOMIST

LOCATION:

The agronomist will reside in Kara. Principal work sites will be the demonstration and training fields to be located at ten technical support centers (Centres d'Appui Technique - CAT) in the Kara and the Savanes regions, the pasture and croplands located around the Agbassa and Tantiegou cattle buying, holding and distribution centers, and areas of animal traction extension activity in the two northern regions. Extensive travel and field work under rudimentary living conditions will be necessary.

REPORTING ARRANGEMENTS:

The agronomist will report to the northern coordinator for regional animal traction extension activities, the Project Director. He/She will be expected to interact on a regular basis with extension and production staff of the DRDR. He/She will be a member of the project Technical Assistance Team.

SCOPE OF WORK:

1. ADAPTIVE FIELD TESTING OF TECHNICAL PACKAGE ELEMENTS

While much research on animal traction technologies and their integration with cropping practices has been done in West Africa and in the same or similar agro-ecological zones, field tests are required to adopt this research to the overall Togolese farming context. The agronomist will work with regional staff to develop a phased program of observational tests of technologies on field-sized parcels at the CAT sites and on farmer controlled parcels.

- First priority for field testing will be given to greater utilization of the existing elements of the equipment package, especially the use of weeding equipment;
- another key category will include tillage practices - reduced tillage intensity, scarification, ridging, tie-ridging and post-harvest tillage;
- intercropping to include in-row segments and alternating row systems to demonstrate compatibility of draft animal mechanization and intercropping practices;
- demonstration of crushed rock phosphate and sulfur applications;
- test of forage crop establishment as an undersown relay crop to extend dry season forage availability or to establish legumes as a fallow pasture component;
- one hectare observational test of Leviaena leviocephala as an alley forage crop species.

2. CAT DEMONSTRATIONS

The agronomist will work with GOT extension personnel, and other project technical assistants, to program demonstrations at CATs throughout the growing season. The emphasis will be on cultural practices that are extension themes:

- use of the weeding triangle
- use of the peanut lifter,
- weeding with a single animal,
- cows as work animals,
- conservation of crop by-products
- manure composting.

Demonstrations will be kept separate from field test sites, deal with already tested technologies and use only the equipment a farmer has or can obtain easily.

3. TRAINING

a) The agronomist will provide technical inputs into the development of animal traction training modules, e.g., equipment, foodcrops, forage crops, intercropping, plowing, ridging, weeding, harvesting, crop by-products and hay conservation, etc.

b) The agronomist will play an active role in the progressive transfer of farmer training from regional centers to CATs to on-farm sessions.

4. MONITORING AND EVALUATION

The agronomist will work with other team members to provide guidance on farm-level data collection, analysis and interpretation in areas, such as:

- farm size, structure,
- multiple cropping patterns,
- yield determinations,
- planting dates,
- weeding practices,
- labor utilization,
- pasture, grazing land utilization,
- crop storage,
- fallow cycles,
- tree crop use,
- field expansion,
- input use,
- measures of animal traction adoption.

The agronomist will also provide inputs into analysis procedure for monitoring macro-level conditions:

- cropped area expansion,
- run-off estimates, based on stream flow and rainfall records,
- decade rainfall analysis,
- collection of basic natural resource information on soils, vegetation, land capability and land use.

QUALIFICATIONS

The individual selected should be willing and enthusiastic about daily programming of work with a broad range of Togolese staff.

The agronomist will have to have a M.S. in agriculture, agronomy, crop-science or a related field. A minimum of four years experience with African agricultural systems is required, including work with animal traction cropping practices, traditional smallholder agriculture and agricultural extension.

The person who is selected for this position must have FSI certified speaking and reading skills at the S-3 and R-3 level in French.

JOB DESCRIPTION

LIVESTOCK SPECIALIST

LOCATION:

The livestock specialist will reside in Dapaon, the capital of the Savanes region. The principal work sites initially will be Tantiegou, where the national animal buying center is to be constructed, Toaga, the temporary buying center and holding site, and Agbassa, the current holding site for the Kara region. The specialist will have to undertake significant amounts of travel to the technical support centers (CATs) in both the Savanes and the Kara regions to investigate on-farm animal husbandry questions and may need to travel to dry season grazing areas in Upper Volta, Ghana and Benin.

REPORTING ARRANGEMENTS:

The livestock specialist will report to the national head of PROPTA in Atakpame through the Project Director, the northern regional coordinator of animal traction extension activities, situated in Kara. He/She will be a member of the project Technical Assistance Team.

SCOPE OF WORK:

1. ANIMAL PURCHASE, HOLDING AND DISTRIBUTION

The livestock specialist will work with Togolese counterpart staff to establish standard operating procedures for the purchase, quarantine, and distribution of draft animals for all animal traction projects in Togo. This work will include the transfer of buying operations from the temporary holding pens in Toaga and Dapaon to Tantiegou as a first priority for the 1983/84 season. Standard procedures need to be developed for:

- evaluation of animal conformation and suitability for draft work;
- animal handling procedures during purchase, i.e., ear tagging, ear tatooing, deticking, purchase records, shipping records;
- feed rations for the dry and rainy seasons;
- open-grazing, confined pasture and ration feeding programs for a herd of cattle; and,
- arrangements with the animal health service for health inspections, vaccination, sleeping sickness treatments, deworming, easing of shipping stress and other special treatments.

2. FARM LEVEL ANIMAL HEALTH CARE FOLLOW-UP

The project will call on the veterinary skills of the animal health service (Division of Veterinary Services and Animal Health - DVSA) to supply regular health care to draft animals at the farm-level. Current

modes of DVSA operations encompass vaccination campaigns, inspection of marketed livestock and acute illness and injury care at the farm. Draft animals distributed to farmers will require a different type of care, one based on programmed preventative intervention to ensure animal well-being and to meet the contractural obligations of the animal insurance program. While the livestock specialist will not be involved directly in animal diagnosis and treatment, the person selected for the job will work with PROPTA officials, DVSA staff, and regional extension management personnel to develop a central livestock registry and draft animal health card systems. The registry and card systems will be used to program health care, back-up insurance claim decisions and monitor the special health requirements of the draft animal population.

3. ON-FARM FEED AND NUTRITION

The adoption of animal traction requires the intensification of animal husbandry activities on the farm. A special emphasis must be put on maintaining animal weight and conditioning throughout the year, with special attention to dry season maintenance and growing season work needs for carbohydrate, protein and mineral nutrition. Project efforts in this regard will be focused initially on farmer management of locally available forage, browse, fodder and cured fodder. Special attention will be paid to better utilization and conservation of crop by-products, such as cereal crop stover, peanut hay, cowpea hay, etc. Working with the agronomist, the livestock specialist will investigate the introduction of leguminous forage and fallow forage cover crops into farm rotations.

The livestock specialist will also work with regional animal productions and extension authorities to develop work ration recommendations and to determine practical procedures for supplementary ration supply, e.g., between grain, cotton seed, and provision of mineral supplements from locally found deposits, without recourse to expensive imported salt and mineral licks.

Given the animal supply questions, particular effort should be directed to the nutritional needs of cows used for draft purposes. Attention should be paid in these investigations to maintenance, work and lactation requirements for working cows. A corollary effort would be the examination of the nutritional requirements of calves weaned during the dry season.

4. HERD MANAGEMENT

Current demand for male animals in the useful age classes for animal traction is high, both for meat and draft. The availability of imported animals is restricted, due to heavy competition from Nigeria for Upper Volta and Benin cattle herds.

Current Togolese efforts at increasing cattle production mainly follow capital intensive methods. Little if any attention has been paid to improving extensive herd management with herd health, grazing management or selective breeding procedures.

The livestock specialist will participate in the elaboration of two types of herd management studies. The first will involve the observation of extensive herd management practiced by the Peul and other ethnic groups. Both the Animal Production Service and the Agricultural Survey and Statistics Service will be involved in the effort to design a sampling and data collection activity. This activity will be integrated within the agricultural production sample survey carried out each year on questions of herd growth rate and composition, life structure, pasture land occupation, migration routes, watering and grazing rights and practices, health, etc.

The second element of herd management will involve the development of pilot herds of up to 70-80 animals at Tantiegou and Agbassa. These herds will be used to study the possibilities for low-capital production improvements. These activities will focus on good management practices to produce good quality draft animals under extensive or semi-extensive conditions. Particular attention will be paid to the breeding cycles in the herds and the need to improve dry season animal conditions and fertility rates.

5. TRAINING

Along with the other technicians on the team, the livestock specialist will be expected to provide technical inputs into the development of training curricula and materials for animal health, production and extension personnel.

6. MONITORING AND EVALUATION

The specialist will advise M&E personnel on sampling, data collection and analysis of livestock information.

QUALIFICATIONS:

Due to the short duration of the assignment (two years), the livestock specialist needs the ability to start quickly and concentrate on early set-up and transfer of cattle buying and holding operations from Toaga to Tantiegou. The individual should be enthusiastic about daily work with a variety of counterparts.

The livestock specialist must have a M.S. degree in animal science with some training or experience in range or pasture management. He/She should have a minimum of four years experience with African livestock and animal traction problems West African experience is preferred.

The individual should have S-3 and R-3, FSI certified speaking and reading levels.

MINIST. PLAN,
ET DE LA REFORME ADMINISTRATIVE

14 - 1

REPUBLIQUE TOGOLAISE
Union - Paix - Solidarité

CABINET

ANNEX FOURTEEN

GOVERNMENT OF TOGO REQUEST FOR ASSISTANCE

Lomé, le 2 SEP. 1982

N° 1649 /MPRA/CAB

Le Ministre du Plan,

et de la Reforme Administrative

à Monsieur LE REPRESENTANT DE L'US.AID AU TOGO
AMBASSADE DES ETATS-UNIS AU TOGO

L O M E

Monsieur la Représentant,

Nous avons eu l'occasion de bénéficier du concours de l'organisme que vous représentez chez nous, pour le développement et la promotion de la culture attelée dans la région de la Kara et d'un commun accord, nous avons envisagé, tout récemment d'étendre cette opération à l'ensemble de la zone nord du pays ; incluant précisément les régions de la Kara et des Savanes. par ailleurs l'institution nationale qui est en train de voir le jour et qui vise, à la promotion de la culture attelée à l'échelon national, doit pouvoir bénéficier également du concours de votre organisme.

Par la présente, je voudrais vous réitérer le vif intérêt que nous manifestons à l'égard, d'une part de la promotion de la culture attelée au TOGO et d'autre part, du concours précieux que nous attendons de vous pour développer chez nous cette technique.

Veuillez agréer, monsieur le Représentant, l'assurance de ma considération distinguée.-

P. le Ministre du Plan et de la Réforme Adm.
Le Ministre du Développement Rural,

A. GASSOU

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693-0218

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AIDAC, ABIDJAN FOR REDSO/WA CHRON

E.O. 12065: N/A
TAGS:
SUBJECT: TOGO ANIMAL TRACTION DEVELOPMENT (693-0218):
PID REVIEW

1. FOLLOWING PRELIMINARY PID REVIEW, MAY 20, AND EXTENDED OPPORTUNITY FOR ALL INTERESTED PARTIES TO EXAMINE DOCUMENT, PID REVIEW COMMITTEE ON MAY 27, RECOMMENDED PID APPROVAL AND DEVELOPMENT OF PP FOR FY 83 DESIGN. ECPR LEVEL REVIEW HELD JUNE 16, 1982 CHAIRED BY REGIONAL DAA/AFR CORREL.

REVIEW COMMITTEE RECOMMENDED APPROVAL, IN PART, TO A GENERALLY COMPLETE DOCUMENT. NONETHELESS, EVOLVING NATURE AND SUBSTANCE OF AID POLICIES AND GUIDELINES, AS REFLECTED IN DIRECTIVES AND HANDBOOKS, LEAD THE REVIEW COMMITTEE TO CHARGE THE PP TEAM WITH THE INSTRUCTIONS, RECOMMENDATIONS AND COMMENTS DETAILED BELOW.

2. PROJECT ECONOMIC ANALYSIS: REVIEW COMMITTEE EMPHASIZES

THAT THE PROJECT SHOULD BE BASED UPON A SYSTEMATIC FINANCIAL AND ECONOMIC ANALYSIS. THE FINANCIAL ANALYSIS REQUIRES THAT ALL COST AND INCOME STREAMS BE ESTIMATED. ECONOMIC ANALYSIS WILL CONSIST OF QUANTITATIVE AND QUALITATIVE SECTIONS. (A) QUANTITATIVE SECTION WILL ESTIMATE INTERNAL RATE OF RETURN OR OTHER APPROPRIATE BENEFIT-COST TYPE ANALYSIS OF THE PROJECT OR OF INDIVIDUAL PROJECT ACTIVITIES WHICH IN TURN CAN BE AGGREGATED. ECONOMIC ANALYSIS SHOULD STRIVE TO INCORPORATE EFFECTS OF MAJOR DISTORTIONS, PARTICULARLY INPUT AND OUTPUT SUBSIDIES. (B) QUALITATIVE SECTION SHOULD CRITICALLY DISCUSS OTHER ECONOMIC EFFECTS OR CHARACTERISTICS OF PROJECT SUCH AS ECONOMIC LINKAGE POTENTIAL, INCOME DISTRIBUTIONS, AND FOREIGN EXCHANGE EFFECTS.

ECONOMIC ANALYSIS SHOULD CONSIDER HOW RECURRENT COSTS (POST-PROJECT) WILL BE MET, I.E., PRIVATELY BY USER FEES, OR PUBLICLY BY GOVERNMENT PROGRAMS. IF THE GOVERNMENT WILL INCUR RECURRENT COSTS, THEN A DISCUSSION SHOULD BE INCLUDED OF THE GOT'S FUTURE BUDGET CAPACITY.

3. PROJECT VIABILITY: THE REVIEW COMMITTEE ASSUMES THAT OAR/LOME WOULD NOT HAVE PROPOSED THE SUBJECT PID UNLESS THE MISSION BELIEVES, BASED IN PART ON EXPERIENCE, THAT THERE IS A SOLID PROSPECT OF BEING ABLE TO OFFER ADDITIONAL TOGOLESE FARMERS ANIMAL-TRACTION TECHNOLOGY THAT

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IS A GOOD INVESTMENT FOR THEM AND THAT THEREFORE THEY WILL, WITH SOME EXPERIENCE, DEMAND AND BE WILLING TO BUY AT FULL COST. THE CONSULTANT GAVE SOME ASSURANCE ON THIS POINT.

HOWEVER, THE STATEMENT IN THE PID THAT "FOR MANY REASONS, AN AGRONOMIC PACKAGE THAT WORKS IN ASSOCIATION WITH ANIMAL TRACTION HAS NOT BEEN DEVELOPED" PUZZLED AND CONCERNED SOME MEMBERS OF THE REVIEW COMMITTEE. THE COMMITTEE TAKES IT TO MEAN THAT AN ANIMAL-TRACTION TECHNIQUE APPROPRIATE TO A SPECIFIC AREA MUST BE WORKED OUT IN THE AREA ITSELF AND THAT THE MISSION FIRMLY EXPECTS THAT THIS CAN BE DONE EARLY IN THIS PROJECT. THE COMMITTEE IS WILLING TO ACCEPT THIS ON THE BASIS OF THE CONSULTANT'S ASSURANCES AND ON THE BASIS OF THE AVAILABILITY OF A SUBSTANTIAL AMOUNT OF EXPERIENCE WITH ANIMAL TRACTION IN THE REGION UNDER THE AIP, THE ENTENTE FUND FOOD PRODUCTION PROJECT, AND RELATED EFFORTS IN BENIN, GHANA, AND UPPER VOLTA.

THE PROJECT PACKAGE MUST BE KEPT VIABLE THROUGH THE INSERTION OF A STRONG AND COMPLETE MONITORING AND EVALUATION PLAN, CONTAINED IN THE PP, WHICH INCLUDES ELEMENTS OF FIELD TESTING AND PRACTICAL APPLICATIONS OF THE PACKAGE IN ORDER TO IDENTIFY WAYS AND MEANS BY WHICH PROJECT ELEMENTS MAY BE ADJUSTED THROUGHOUT THE COURSE OF IMPLEMENTATION. EARLY AND REPEATEDLY SCHEDULED EVALUATIONS (FOLLOWING UP ON A RIGOROUS PLAN OF MONITORING) SHOULD PROVIDE THE REQUISITE FEEDBACK TO ADJUST THE PACKAGE, INCLUDING SUPPORT SYSTEMS, TO FIT THE FARMER'S CROP AND CASH NEEDS.

OPPORTUNITY FOR SUCCESS AND POTENTIAL EXPANSION OF AN ANIMAL TRACTION PROGRAM IN TOGO SHOULD NOT BE JEOPARDIZED BY INCLUDING WITHIN THE PROJECT MANY SUB-ACTIVITIES WHICH ARE AT BEST SECONDARY TO THE BASIC PURPOSE OF THE PROJECT. THE PP TEAM SHOULD SUGGEST GOT OR OTHER FUNDING AGENCIES (FED, IBRD, UNDP, VOLAGS) AT WORK IN NORTHERN TOGO CONSIDER SUPPORT TO OTHER SUB-ACTIVITIES WHICH DO NOT FIT WITHIN THE AID PROJECT'S OBJECTIVE AND RESOURCE CONSTRAINT.

4. TECHNICAL ISSUES:

(A) ANIMALS: REVIEW COMMITTEE AGREED WITH DRAFTERS OF PID RE PREEMINENT IMPORTANCE OF DRAFT ANIMALS. A NUMBER OF RELATED POINTS WERE DISCUSSED:

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A. ADEQUATE VETERINARY SUPPLIES AND SERVICES MUST BE ASSURED.

B. DEMAND AND SUPPLY OF SUITABLE DRAFT ANIMALS IN SUFFICIENT NUMBERS MUST BE WORKED OUT WITH ALL OTHER INTERESTED PARTIES.

C. THE EVENTUAL ROLE OF PRIVATE SUPPLIERS OF ANIMALS SHOULD BE CONSIDERED AND PROVISIONS/ALLOWANCES MADE FOR SUCH, GIVEN EXPERIENCES IN BENIN.

D. TOGO'S CONSUMPTION OF RED MEAT IS AMONG THE LOWEST IN WEST AFRICA, ACCORDING TO THE FAO, AND THEREFORE HAS A SUBSTANTIAL POTENTIAL FOR GROWTH. ONCE ANIMAL TRACTION TECHNIQUES ARE ESTABLISHED, DEMAND FOR MEAT SHOULD PROVE TO BE COMPLEMENTARY WITH THEM SINCE THE OLDER ANIMALS WILL HAVE A SLAUGHTER-VALUE WHEN THEY CAN NO LONGER WORK. HOWEVER, DEMAND FOR MEAT COULD INITIALLY DIVERT ANIMALS FROM FARM WORK, BEFORE THE PROFITABILITY OF ANIMAL TRACTION TECHNIQUES IS ESTABLISHED. THE PP SHOULD ADDRESS THE POTENTIAL PROBLEM OF DIVERSION OF DRAFT ANIMALS TO PREMATURE SLAUGHTER FOR MEAT.

E. DRAFT ANIMALS IN WEST AFRICA ARE BULLS OR BULLOCKS NOT OXEN, DESPITE THE COMMON USAGE TO THE CONTRARY.

F. A SOUND DRAFT ANIMAL INSURANCE PLAN SHOULD BE DESIGNED AND INSERTED INTO TOGO'S NATIONAL ANIMAL TRACTION PROGRAM.

G. SINGLE DRAFT ANIMALS AND THE RELATED TECHNOLOGY SHOULD BE PROMOTED WHEREVER FEASIBLE. THERE ARE MANYDISTINCT ADVANTAGES IN COST, EASE OF OPERATIONS, IMPACT ON ANIMAL SUPPLY, FEEDING, AND ENVIRONMENTAL CONCERNS FROM UTSNG SINGLE DRAFT ANIMAL TRACTION.

H. DUAL OR GROUP OWNERSHIP OF DRAFT ANIMALS APPEARS TO BE FRAUGHT WITH PROBLEMS. THIS SHOULD BE DISCOURAGED.

I. HEALTH CONCERNS: ZOONOTIC DISEASE CONTROL/PREVENTION SHOULD BE ADDRESSED BY THE PP TEAM.

(B) ENVIRONMENTAL CONCERNS: THE EFFECT OF ANIMAL TRACTION ON THE SOIL'S PHYSICAL STRUCTURE AND ON THE WATER REGIME SHOULD BE ADDRESSED IN ADDITION TO EFFECTS ON THE AVAILABILITY OF NUTRIENTS. COMPACTION AND EROSION BY WIND AND WATER ARE CONCEIVABLE PROBLEMS. THE AGRICULTURALIST AND ENVIRONMENTALIST OF THE PP TEAM SHOULD EXAMINE THE EFFECT OF ANIMAL TRACTION ON SOIL FERTILITY. THE USE OF GREEN AND ANIMAL MANURES SHOULD BE CONSIDERED.

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(C) MIXED FARMING: THE INTRODUCTION OF WORKING ANIMALS ON THE FARM IS THE BEST ARGUMENT FOR THE INTEGRATION OF CROPPING AND LIVESTOCK. THE PP TEAM SHOULD LOOK AT THE POTENTIALS FOR MIXED FARMING, AND DEFINE MODEST SCHEMES TO ASSIST THE FARMER TO REALIZE BENEFITS FROM THIS LINKAGE.

(D) CREDIT: BOTH INSTITUTIONS AND METHODS MUST BE ADEQUATELY COVERED IN THE PP. REVIEW COMMITTEE IS CONCERNED THAT PROBLEMS LATER ON BE AVOIDED.

- A. LOAN AMORTIZATION SCHEDULES MUST BE ESTABLISHED
- FROM THE OUTSET OF THE PROJECT. THE FINANCIAL
- PART OF THE PROJECT SHOULD BE DESIGNED IN SUCH
- AWAY AS TO ASSURE REPAYMENT OF LOANS.

- B. OPTIONS FOR THE PROGRAMING OF REPAID LOANS SHOULD
- BE ADDRESSED BY THE PP TEAM, AND A DEFINITE PLAN
- WORKED OUT WHICH COULD THEN BE MODIFIED IN THE
- COURSE OF PROJECT IMPLEMENTATION, ACCORDING TO
- NEEDS.

C. THE REVIEW COMMITTEE STRONGLY DOUBTS THAT REDUC-
- TIONS IN INTEREST RATES HAVE ANY SUBSTANTIAL
- IMPACT ON FARMERS' INTEREST IN ADOPTING ANIMAL
- TRACTION TECHNIQUES. LOWER INTEREST RATES COULD,
- HOWEVER, AFFECT THE VIABILITY OF INSTITUTIONS
- THAT EXTEND CREDIT, WHICH COULD THEREFORE RESULT
- IN LESS CREDIT BEING AVAILABLE AND IN REDUCTION
- OF THE RATE OF ADOPTION. THE SUBJECT PROJECT
- SHOULD NOT, THEREFORE ENCOURAGE REDUCTIONS IN
- INTEREST RATES, ALTHOUGH IT IS UNDERSTOOD THAT
- INTEREST-RATE CONTROLS MAY BE IMPOSED BY THE GOT
- OR OTHER DONORS. THE MISSION SHOULD TRY TO
- PERSUADE THE GOT AND OTHER DONORS TO AVOID THE
- PROBLEMS CAUSED BY SUCH CONTROLS, IF NECESSARY.

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(F) LINKAGES - COORDINATION: THE PP TEAM SHOULD ABIDE BY CURRENT AID STRATEGY GUIDELINES FOR PROJECT DESIGN AND IMPLEMENTATION IN TOGO, PARTICULARLY WITH REGARD TO:

- A. OTHER AID ACTIVITIES IN TOGO (OIC-TRAINING, YOUNG FARMERS, BLACKSMITHS ETC).

- B. AFRICAN INSTITUTIONS (INADES-TRAINING)

- C. OTHER DONORS (IBRD, FAO/UNDP, FED, FAC, VOLAGES)

5. MANAGEMENT

(A) GIVEN THE IMPORTANCE OF CONTINUALLY ASSESSING AGRONOMIC AND ECONOMIC VIABILITY OF ANIMAL TRACTION THROUGHOUT ACTIVITY IMPLEMENTATION, THE REVIEW COMMITTEE BELIEVES THAT AN AGRICULTURAL ECONOMIST SHOULD BE ADDED TO THE LIST OF TECHNICAL ASSISTANTS, AND THAT THIS POSITION WOULD ALSO ASSUME THE FUNCTIONS OF CREDIT, PROGRAM SUPERVISION EVALUATION AND MONITORING. THE T.A. TEAM COORDINATOR MUST BE LEFT TO WORKING PRINCIPALLY WITH INSTITUTION BUILDING AND LINKAGES WITH GOT AND OTHER DONORS ACTIVITIES.

(B) REVIEW COMMITTEE DOUBTS THAT PERSONAL SERVICE CONTRACTING CAN PROVIDE THE TIMELY, QUALITY TECHNICAL

ASSISTANCE TO THE PROJECT, WITHOUT PLACING EXTRAORDINARY AND INTOLERABLE BURDENS ON THE MISSION AND THE PROJECT COORDINATOR. PP TEAM SHOULD PROVIDE:

- A. DETAILED SCOPES OF WORK FOR THE TA MEMBERS (INCLUDING PERIODS OF SERVICE)

- B. DETAILED ANALYSIS OF PROPOSED KIND OF CONTRACTING MODE REQUIRED TO FURNISH TA.

(C) THE BUDGET SHOULD INCLUDE A LINE-ITEM FOR EXTERNAL EVALUATION (S).

(D) THE PP TEAM IS ENJOINED NOT TO EXCEED THE DOLS 5 MILLION LIMIT.

(E) REDSO: PLEASE CONFIRM AVAILABILITY OF REQUIRED DESIGN SUPPORT ASSISTANCE, AS INDICATED ON PID FACESHEET. PP DESIGN EFFORT TO OCCUR IN JUNE AND JULY WITH ESTIMATED DATE OF SUBMISSION, AUGUST 2. NOTE: MOST REDSO INPUTS WILL BE PUNCTUAL, OF A TWO-WEEK DURATION, AT A POINT IN-TIME WHICH WILL BE WORKED OUT BETWEEN OAR/LOME AND REDSO.

(F) AID/W HAS PROVIDED FOR CONTRACTING OF TWO CONSULTANTS: AGRICULTURALIST AND AGRICULTURE ECONOMIST.

6. ICPR, IN ADDITION TO SUPPORTING ABOVE RECOMMENDATIONS, EXPRESSED CONCERN OVER DIVERSE PROJECT PORTFOLIO AND RELATION TO STAFF SIZE AND THAT OAR STAFFING MIGHT NOT PROVIDE DEPTH OF MANAGEMENT CAPABILITY NECESSARY FOR THIS COM-

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PLEX PROJECT. ECPR ALSO HAD RESERVATIONS ON USE OF CONTRACTORS UNFAMILIAR WITH AID PROCEDURES OR TOGO ENVIRONMENT. PP MUST SHOW THAT OAR WILL BE ABLE TO PROVIDE ADEQUATE AID PROJECT MANAGEMENT COVERAGE, AND THAT STEPS WILL BE TAKEN BY OAR OVER NEXT FEW YEARS TO REDUCE PROLIFERATION OF PORTFOLIO, AND MOVE TOWARD GREATER CONCENTRATION WHICH WILL BE MORE COMPATIBLE WITH STAFF SIZE AND CAPABILITY.

7. REVIEW COMMITTEE SPECIFIED THAT COMPLETED PP BE SUBMITTED TO AID/W FOR REVIEW AND AUTHORIZATION. THOUGH AN ATTEMPT WILL BE MADE TO AUTHORIZE IN FY 1982, OAR SHOULD BE AWARE THAT CONCERNS ARE SUCH THAT THIS CANNOT BE GUARANTEED. WE RECOGNIZE BUDGET LIMITATIONS AND PORTFOLIO ABSORPTION CAPACITY, BUT REACTION OF ECPR WAS THAT INITIAL OBLIGATION THIS PROJECT SHOULD BE IN DOLS 2.0-2.5 MILLION RANGE, RATHER THAN 1.0 MILLION DOLS PROPOSED. THIS FACTOR WILL BE CONSIDERED DURING PP REVIEW IN WASHINGTON ALONG WITH OTHER NEEDS IN TOGO AND ELSEWHERE IN BUREAU. HAIG
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ANNEX Sixteen: AID PROJECT STATUTORY CHECKLISTS

5C(1) - COUNTRY CHECKLIST

Listed below are statutory criteria applicable generally to FAA funds, and criteria applicable to individual fund sources: Development Assistance and Economic Support Fund.

A. GENERAL CRITERIA FOR COUNTRY ELIGIBLITY

1. FAA Sec. 481. Has it been determined that the government of the recipient country has failed to take adequate steps to prevent narcotic drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to U.S. Government personnel or their dependents, or from entering the U.S. unlawfully? — No

2. FAA Sec. 620(c). If assistance is to a government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) the debt is not denied or contested by such government? — No

3.	FAA Sec. 620(e)(1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities?	No
4.	FAA Sec. 532(c), 620(a), 620(f), 620D; FY 1982 Appropriation Act Secs. 512 and 513. Is recipient country a Communist country? Will assistance be provided to Angola, Cambodia, Cuba, Laos, Vietnam, Syria, Libya, Iraq, or South Yemen? Will assistance be provided to Afghanistan or Mozambique without a waiver?	N/A
5.	ISDCA of 1981 Secs. 724, 727 and 730. For specific restrictions on assistance to Nicaragua, see Sec. 724 of the ISDCA of 1981. For specific restrictions on assistance to El Salvador, see Secs. 727 and 730 of the ISDCA of 1981.	N/A
6.	FAA Sec. 620(j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction by mob action of U.S. property?	No

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7.	FAA Sec. 620(l). Has the country failed to enter into an agreement with OPIC?	No
8.	FAA Sec. 620(o); Fishermen's Protective Act of 1967, as amended, Sec. 5. (a) Has the country seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters?	No
	(b) If so, has any deduction required by the Fishermen's Protective Act been made?	No
9.	FAA Sec. 620(q); FY 1982 Appropriation Act Sec. 517. (a) Has the government of the recipient country been in default for more than six months on interest or principal of any AID loan to the country?	No
	(b) Has the country been in default for more than one year on interest or principal on any U.S. loan under a program for which the appropriation bill appropriates funds?	No
10.	FAA Sec. 620(s). If contemplated assistance is development loan or from Economic Support Fund, has the Administrator taken into account the amount of foreign exchange or other resources which the country has spent on military equipment? (Reference may be made to the annual "Taking into	N/A

Consideration" memo: "Yes, taken into account by the Administrator at time of approval of Agency OYB." This approval by the Administrator of the Operational Year Budget can be the basis for an affirmative answer during the fiscal year unless significant changes in circumstances occur.)

11. FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?

No

12. FAA Sec. 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the AID Administrator in determining the current AID Operational Year Budget? (Reference may be made to the Taking into Consideration memo.)

According to 81 USUN, 0094, Togo was current on its dues as of January 1981. No more recent information has been received on this.

13. FAA Sec. 620A; FY 1982 Appropriation Act Sec. 520. Has the country aided or abetted, by granting sanctuary from prosecution to, any individual or group which has committed an act of international terrorism? Has the country aided or

No

abetted, by granting sanctuary from prosecution to, any individual or group which has committed a war crime?

14. FAA Sec. 666. Does the country object, on the basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. who is present in such country to carry out economic development programs under the FAA? — No

15. FAA Sec. 669, 670. Has the country, after August 3, 1977, delivered or received nuclear enrichment or reprocessing equipment, materials, or technology, without specified arrangements or safeguards? Has it transferred a nuclear explosive device to a non-nuclear weapon state, or if such a state, either received or detonated a nuclear explosive device, after August 3, 1977? (FAA Sec. 620E permits a special waiver of Sec. 669 for Pakistan.) — No

16. ISDCA of 1981 Sec. 720. Was the country represented at the Meeting of Ministers of Foreign Affairs and Heads of Delegations of the Non-Aligned Countries to the 36th General Session of the General Assembly of the U.N. of Sept. 25 and 28, 1981, and failed — No

to disassociate itself from the communique issued? If so, has the President taken it into account? (Reference may be made to the Taking into Consideration memo.)

17. ISDCA of 1981 Sec. 721. See special requirements for assistance to Haiti. N/A

B. FUNDING SOURCE CRITERIA FOR COUNTRY ELIGIBILITY

1. Development Assistance Country Criteria.

a. FAA Sec. 116. Has the Department of State determined that this government has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, can it be demonstrated that contemplated assistance will directly benefit the needy? No

2. Economic Support Fund Country Criteria

a. FAA Sec. 502B. Has it been determined that the country has eng[illegible] in a consistent pat[illegible] of gross violations o[illegible] internationally recognized human rights? If so, has the country made such significant improvements in its human rights record that furnishing such assistance is in the national interest? N/A

b. ISDCA of 1981, Sec. 725(b). If ESF is to be furnished to Argentina, has the President certified that (1) the Govt. of Argentina has made significant progress in human rights; and (2) that the provision of such assistance is in the national interests of the U.S.?	N/A
c. ISDCA of 1981, Sec. 726(b). If ESF assistance is to be furnished to Chile, has the President certified that (1) the Govt. of Chile has made significant progress in human rights; (2) it is in the national interest of the U.S.; and (3) the Govt. of Chile is not aiding international terrorism and has taken steps to bring to justice those indicted in connection with the murder of Orlando Letelier?	N/A

5C(2) PROJECT CHECKLIST

Listed below are statutory criteria applicable to projects. This section is divided into two parts. Part A. includes criteria applicable to all projects. Part B. applies to projects funded from specific sources only: B.1. applies to all projects funded with Development Assistance Funds, B.2. applies to projects funded with Development Assistance loans, and B.3. applies to projects funded from ESF.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?

A. GENERAL CRITERIA FOR PROJECT

1. FY 1982 Appropriation Act Sec. 523; FAA Sec. 634A; Sec. 653(b).

(a) Describe how authorizing and appropriations committees of Senate and House have been or will be notified concerning the project; (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than $1 million over that amount)?

Congressional Presentstion: FY

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Congressional Notification:

Yes

2. FAA Sec. 611(a)(1). Prior to obligation in excess of $100,00, will there be

Yes

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(a) engineering, financial or other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?	Included in this PP.
3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?	GOT, in official correspondance, has affirmed its intention to procede promptly with the creation (by Ministerial decree) of the PROPTA organization.
4. FAA Sec. 611(b); FY 1982 Appropriation Act Sec. 501. If for water or water-related land resource construction, has project met the standards and criteria as set forth in the Principles and Standards for Planning Water and Related Land Resources, dated October 25, 1973? (See AID Handbook 3 for new guidelines.)	Yes, see Environmental Assessment.
5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed $1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project?	Yes, appropriate chapters in the PP address the question of utilization, upkeep and recurrent costs.

6. FAA Sec. 209. Is project susceptible to execution as part of regional or multilateral project? If so, why is project not so executed? Information and conclusion whether assistance will encourage regional development programs.

No

AID's peculiar and strong position in Animal Traction programs in Togo has led the GOT to request AID to take a leading role in the national program. The AID projectwill serve as a catalyst among other donors involved in animal traction.

7. FAA Sec. 601(a). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; and (c) encourage development and use of cooperatives, and credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.

(a) cattle import to Togo from neighboring states should increas; (b) there are several opportunities for the encouragement of provate enterprise-type activities (addressed in the PP); (c) the project is closely linked to the national agricultural credit union and private savings and credit groups thru Togo Credit/Savings National Union (693 0224); (d) project helps to diversify access routes to ag inputs; (e) PROPTA is to coordinate animal traction supply and backstopping activities on a nation level; (f) N/A.

8. FAA Sec. 601(b). Information and conclusions on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).

Limited use is being made through this project of U.S. manufactured goods. Some veterinary supplies originate in the U.S., and as the livestock industry is developed in Togo, there may exist increasing opportunities for U.S. trade.

9.	FAA Sec. 612(b), 636(h); FY 1982 Appropriation Act Sec. 507. Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars.	GOT is meeting virtually all local costs related to salaries those employed under the project, of a local operating costs (utilities, gas and oil), locally obtainable construction materials.
10.	FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release?	No
11.	FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?	Yes
12.	FY 1982 Appropriation Act Sec. 521. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity?	No export commodities are likely to be a result of this project. Only indirectly, with increased cereal grain production, might there result something which may reach the international market. The amount would be insignificant.
13.	FAA 118(c) and (d). Does the project comply with the environmental procedures set forth in AID Regulation 16? Does	Yes

the project or program take into consideration the problem of the destruction of tropical forests?

14. FAA 121(d). If a Sahel project, has a determination been made that the host government has an adequate system for accounting for and controlling receipt and expenditure of project funds (dollars or local currency generated therefrom)? — N/A

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FAA Sec. 102(b), 111, 113, 281(a). Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using the appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and

(a) issue of involvement of local populations is addressed in PP Social Soundness Analysis.

(b) While no specific project component will work for the creation of cooperatives, the activity complements efforts made by the GOT and other donors in this area. Specifically, AID supports a parallel activity Togo Credit/Savings National Union (693 0224).

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otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries?	(c) The project provides many opportunities for farmers and their families to undertake operations, supported by the activity, which can improve their lot. (d) Women's participation in improved farming systems is addressed in the PP. (e) All of the countries in the sub-region are actively pursuing animal traction-type activities.
b. FAA Sec. 103, 103A, 104, 105, 106. Does the project fit the criteria for the type of funds (functional account) being used?	ARDN Yes
c. FAA Sec. 107. Is emphasis on use of appropriate technology (relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor)?	Yes
d. FAA Sec. 110(a). Will the recipient country provide at least 25% of the costs of the program, project, or activitiy with respect to which the assistance is to be furnished (or is the latter cost-sharing requirement being waived for a "relatively least developed" country)?	Yes - See Financial Plan, Contribution of the GOT.

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e. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing, or is the recipient country "relatively least developed"? (M.O. 1232.1 defined a capital project as "the construction, expansion, equipping or alteration of a physical facilit: or facilities financed by AID dollar assistance of not less than $100,000, including related advisory, managerial and training services, and not undertaken as part of a project of a predominantly technical assistance character."	Yes Yes Togo is being considered at the current U.N. General Assembly for recognition as a RLDC.
f. FAA Sec. 122(b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth?	Yes, see Economic Analysis and Technical Analysis.
g. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage	Methods of improved farm management ha been an issue of interest and concern for Togolese, whether farmers or gover ment administrators. Increased food production is a stated national goal. The GOT's educational, research and logistical resources are consistantly plied towards the resolution of issues related to increased food production.

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institutional development; and supports civil education and training in skills required for effective participation in governmental processes esential to self-government.	The GOT is concerned with the long-term institutionalization of the animal traction process. Training of government cadre and private parties in all aspects of rural development is of prodominant importance to GOT plans.

2. Development Assistance Project Criteria (Loans Only)

a. FAA Sec. 122(b). Information and conclusion on capacity of the country to repay the loan, at a reasonable rate of interest.	N/A
b. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete with U.S. enterprises, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?	N/A
c. ISDCA of 1981, Sec. 724 (c) and (d). If for Nicaragua, does the loan agreement require that the funds be used to the maximum extent possible for the private sector? Does the project provide for monitoring under FAA Sec. 624(g)?	N/A

3. Economic Support Fund Project Criteria

a. FAA Sec. 531(a). Will this assistance promote economic or political	N/A

	stability? To the extent possible, does it reflect the policy directions of FAA Section 102?	
b.	FAA Sec. 531(c). Will assistance under this chapter be used for military, or paramilitary activities?	N/A
c.	FAA Sec. 534. Will ESF funds be used to finance the construction of the operation or maintenance of, or the supplying of fuel for, a nuclear facility? If so, has the President certified that such use of funds is indispensable to nonproliferation objectives?	N/A
d.	FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made?	N/A

5C(3) - STANDARD ITEM CHECKLIST

Listed below are the statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the agreement by imposing limits on certain uses of funds.

These items are arranged under the general headings of (A) Procurement, (B) Construction, and (C) Other Restrictions.

A. Procurement

1. FAA Sec. 602. Are there arrangements to permit U.S. small business to participate equitably in the furnishing of commodities and services financed?	Yes, see Procurement Section under Financial Plan
2. FAA Sec. 604(a). Will all procurement be from the U.S. except as otherwise determined by the President or under delegation from him?	Yes, except as otherwise authorized by waivers, herein included.
3. FAA Sec. 604(d). If the cooperating country discriminates against marine insurance companies authorized to do business in the U.S., will commodities be insured in the United States against marine risk with such a company?	N/A
4. FAA Sec. 604(e); ISDCA of 1980 Sec. 705(a). If offshore procurement of agricultural commodity or product is to be	N/A

	financed, is there provision against such procurement when the domestic price of such commodity is less than parity? (Exception where commodity financed could not reasonably be procured in U.S.)	
5.	FAA Sec. 604(g). Will construction or engineering services be procured from firms of countries otherwise eligible under Code 941, but which have attained a competitive capability in international markets in one or these areas?	Yes
6.	FAA Sec. 603. Is the shipping excluded from compliance with requirement in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S. flag commercial vessels to the extent that such vessels are available at fair and reasonable rates?	No
7.	FAA Sec. 621. If technical assistance is financed, will such assistance be furnished by private enterprise on a contract basis to the fullest extent practicable? If the facilities of other	Yes

4/CO

Federal agencies will be utilized, are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs?	N/A
8. International Air Transport. Fair Competitive Practices Act, 1974. If air transportation of persons or property is financed on grant basis, will U.S. carriers be used to the extent such service is available?	
9. FY 1982 Appropriation Act Sec. 504. If the U.S. Government is a party to a contract for procurement, does the contract contain a provision authorizing termination of such contract for the convenience of the United States?	Yes
B. Construction	
1. FAA Sec. 601(d). If capital (e.g., construction) project, will U.S. engineering and professional services to be used?	It is not considered likely, given the nature and the dimensic of the construction under the project.
2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable?	Yes

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3. FAA Sec. 620(k). If for construction of productive enterprise, will agggregate value of assistance to be furnished by the U.S. not exceed $100 million (except for productive enterprises in Egypt that were described in the CP)?	No
C. Other Restrictions	
1. FAA Sec. 122(b). If development loan, is interest rate at least 2% per annum during grace period and at least 3% per annum thereafter?	N/A
2. FAA SEc. 301(d). If fund is established solely by U.S. contributions and administed by an internatioal organization, does Comptroller General have audit rights?	Yes
3. FAA Sec. 620(h). Do arrangements exist to insure that United States foreign aid is not used in a manner which, contrary to the best interests of the United States, promotes or assists the foreign aid projects or activities of the Communist-bloc countries?	Yes
4. Will arrangements preclude use of financing:	Yes
a. FAA Sec. 104(f); FY 1982 Appropriation Act Sec. 525: (1) To pay for performance of abortions as a method of family	

planning or to motivate or coerce persons to practice abortions; (2) to pay for performance of involuntary sterilization as method of family planning, or to coerce or provide financial incentive to any person to undergo sterilization;	Yes
(3) to pay for any biomedical research which relates, in whole or part, to methods or the performance of abortions or involuntary sterilizations as a means of family planning;	Yes
(4) to lobby for abortion?	Yes
b. FAA Sec. 620(g). To compensate owners for expropriated nationalized property?	Yes
c. FAA Sec. 660. ~~To~~ provide training or advice or provide any financial support for police, prisons, or other law enforcement forces, except for narcotics programs?	Yes
d. FAA Sec. 662. For CIA activities?	Yes
e. FAA Sec. 636(i). For purchase, sale, long-term lease, exchange or guaranty of the sale of motor vehicles manufactured outside U.S., unless a waiver is obtained?	Yes
f. FY 1982 Appropriation Act, Sec. 503. To pay pensions, annuities, retirement pay, or	Yes

adjusted service compensation for military personnel?	
g. FY 1982 Appropriation Act, Sec. 505. To pay U.N. assessments, arrearages or dues?	Yes
h. FY 1982 Appropriation Act, Sec. 506. To carry out provisions of FAA section 209(d) (Transfer of FAA funds to multilateral organizations for lending)?	Yes
i. FY 1982 Appropriation Act, Sec. 510. To finance the export of nuclear equipment, fuel, or technology or to train foreign nationals in nuclear fields?	Yes
j. FY 1982 Appropriation Act, Sec. 511. Will assistance be provided for the purpose of aiding the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights?	No
k. FY 1982 Appropriation Act, Sec. 515. To be used for publicity or propaganda purposes within U.S. not authorized by Congress?	Yes

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ANNEX SEVENTEEN PROJECT GRANT AGREEMENT

USAID PROJECT NUMBER 693-0218

PROJECT

GRANT AGREEMENT

BETWEEN

THE REPUBLIC OF TOGO

AND THE

UNITED STATES OF AMERICA

FOR

TOGO ANIMAL TRACTION DEVELOPMENT

DATE:

LOME, TOGO

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USAID PROJECT 693-0218

PROJECT GRANT AGREEMENT

Dated:

Between The Republic of Togo ("Grantee")

And The United States of America, acting through the Agency for International Development (USAID)

Article 1:

The Agreement

The purpose of this Agreement is to set out the understandings of the parties named above ("Parties") with respect to the undertaking by the Grantee of the Project described below, and with respect to the financing of the Project by the Parties.

Article 2:

The Project

2.1 Definition of Project

The Project which is further described in Annex I, will consist of assistance to the Government of Togo to improve farm management tools for increased crop production and to provide the opportunity for farm families to augment their income. To achieve these objectives, the Project will support the major rural development initiative, in concert with the GOT and the other principal donors in-country. The Grant Assistance available under this Agreement is planned over a period of 5 1/2 years, from late 1982 through mid-1988. The categories of assistance that AID will fund include a) institution building, b) training, c) development of extension activities, d) supply of animal traction units and directly related support services, and e) technical advisory services.

Annex I, attached, amplifies the above definition of the Project. Within the limits of the above definition of the Project, elements of the amplified description stated in Annex I may be changed by written agreement of the authorized representatives of the the Parties named in Section 8.3, without formal amendment of this Agreement.

2.2 Incremental Nature of Project

a) USAID's contribution to the Project will be provided in increments, the initial one being made available in accordance with Section 3.1 of this Agreement. Subsequent increments will be subject to availability of funds to USAID for this purposeand to the mutual agreement of the Parties, at the time of a subsequent increment, to proceed.

b) Within the overall Project Assistance Completion Date stated in this Agreement, USAID based upon consultation with the Grantee, may specify in Project Implementation Letters appropriate time periods for the utilization of funds granted by USAID under an individual increment of assistance.

Article 3

Financing

3.1 The Grant

To assist the Grantee to meet the costs of carrying out the Project, USAID, pursuant to the Foreign Assistance Act of 1961, as amended, agrees to grant the Grantee under the terms of this Agreement not to exceed one million United States ("U.S.") Dollars ($, 00,000) ("Grant").

The Grant may be used to finance foreign exchange costs, as defined in Section 6.1, and local currency costs, as defined in Section 6.2, of goods and services required for the Project.

3.2 Grantee Resources for the Project

a) The Grantee agrees to provide or cause to be provided for the Project all funds, in addition to the Grant, and all other resources required to carry out the Project effectively and in a timely manner.

b) The resources provided by Grantee for the Project will be not less than the equivalent of U.S.$1,670,000including costs borne on an " in-kind" basis.

3.3 Project Assistance Completion Date

a) The " Project Assistance Completion Date" (PACD), which is March 31, 1988 , or such other date as the Parties may agree to in writing, is the date by which the Parties estimate that all services financed under the Grant will have been performed and all goods financed under the Grant will have been furnished for the Project as contemplated in this agreement.

b) Except as USAID may otherwise agree in writing, USAID will not issue or approve documentation which would authorize disbursement of the Grant for services performed subsequent to the PACD or for goods furnished for the Project, as contemplated in this Agreement, subsequent to the PACD.

c) Requests for disbursement, accompanied by necessary supporting documentation prescribed in Project Implementation Letters are to be received by USAID or any bank described in Section 7.1 no later than nine (9) months following the PACD, or such other period as USAID agrees to in writing. After such period, USAID, giving notice in writing to the Grantee, may at any time or times reduce the amount of the Grant by all or any part thereof for which requests for disbursement, accompanied by necessary supporting documentation prescribed in Project Implementation Letters, were not received before the expiration of said period.

Article 4

Conditions Precedent

4.1 Disbursement Under the Grant

Prior to disbursement under the Grant, or to issuance by USAID of documentation pursuant to which disbursement will be made for the financing of activities, related to the organization and support of PROPTA (The National Animal Traction Promotion Project), the Grantee will, except as the Parties may otherwise agree in writing, furnish to USAID in form and substance satisfactory to USAID:

An official statement of the Minister of Rural Development, authorizing the creation of the PROPTA (The National Animal Traction Promotion Project), accompanied by an officially accepted and approved set of statutes, or other such organizational documentation, which determines the responsibilities and authorities of PROPTA.

4.2 **Notification**

When USAID has determined that the conditions precedent specified in Section 4.1 and 4.2 have been met, it will promptly notify the Grantee.

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4.3 Terminal Dates for Conditions Precedent

a) If the conditions specified in Section 4.1 have not been met within 90 days from the date of this Agreement, or such later date as USAID may agree to in writing, USAID, at its option, may terminate this Agreement by written notice to Grantee.

b) If all of the conditions specified in Section 4.2 have not been met within 270 days from the date of this Agreement, or such later date as USAID may agree to in writing, USAID, at its option, may cancel the then undisbursed balance of the Grant, to the extent not irrevocably committed to third parties, and may terminate this Agreement by written notice to the Grantee.

Article 5

Special Covenants

5.1 Water Quality

The Grantee agrees (a) that pumps will be installed only on wells that discharge water that is safe according to WHO standards, and (b) that adequate measures will be taken to conserve the quality of the water.

5.2 Maintenance and Repair Systems

The Grantee agrees to pursue actively negotiations with those donors who are currently engaged in metal-working training related to animal traction projects, so as to provide firm assurances at the earliest possible date of adequate funding for a satisfactory program of training and establishing village-level metal-workers. So-called blacksmith shops, spread out over the country, including the Project zone, will be capable of furnishing on-going maintenance and repair (and eventual partial manufacture and assembly) of parts to the animal traction farming equipment which is to be furnished under this Project.

Article 6

Procurement Source

6.1 Foreign Exchange Costs

Disbursements pursuant to Section 7.1 will be used exclusively to finance the costs of goods and services required for the Project having their source and origin in the United States (Code 000 of the USAID Geographic

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Code Book as in effect at the time orders are placed or contracts entered into for such goods or services) (" Foreign Exchange Costs"), except as USAID may otherwise agree in writing, and except as provided in the Project Grant Standard Provisions Annex, Section C.1 (b) with respect to marine insurance.

6.2 Local Currency Costs

Disbursements pursuant to Section 7.2 will be used exclusively to finance the costs of goods and services required for the Project having their source and, except as USAID may otherwise agree in writing, their origin in Togo. ("Local Currency Costs"). To the extent provided for under this Agreement, "Local Currency Costs" may also include the provision of local currency resources required for the Project.

Article 7

Disbursement

7.1 Disbursement for Foreign Exchange Costs

a) After satisfaction of conditions precedent, the Grantee may obtain disbursements of funds under the Grant for the Foreign Exchange Costs of goods or services required for the Project in accordance with the terms of this Agreement, by such of the following methods as may be mutually agreed upon:

(1) by submitting to USAID, with necessary supporting documentation as prescribed in Project Implementation Letters, (a) requests for reimbursement for such goods or services, or (b) requests for USAID to procure commodities or services in Grantee's behalf for the Project; or,

(2) by requesting USAID to issue Letters of Commitment for specified amounts (a) to one or more U.S. banks, satisfactory to USAID, committing USAID to reimburse such bank or banks for payments made by them to contractors or suppliers, under Letters of Credit or otherwise, for such goods or services, or (b) directly to one or more contractors or suppliers, committing USAID to pay such contractors or suppliers for such goods or services.

b) Banking charges incurred by Grantee in connection with Letters of Commitment and Letters of Credit will be financed under the Grant unless Grantee instructs USAID to the contrary. Such other charges as the Parties may agree to may also be financed under the Grant.

7.2 Disbursement for Local Currency Costs

a) After satisfaction of conditions precedent, the Grantee may obtain disbursements of funds under the Grant for Local Currency Costs required for the Project in accordance with the terms of this agreement, by submitting to USAID, with necessary supporting documentation as prescribed in Project Implementation Letters, requests to finance such costs.

b) The local currency needed for such disbursements may be obtained:

(1) by acquisition by USAID with U.S. Dollars by purchase; or

(2) by USAID (a) requesting the Grantee to make available the local currency for such costs, and (b) thereafter making available to the Grantee, through the opening or amendment by USAID of Special Letters of Credit in favor of the Grantee or its designee, an amount of U.S. Dollars equivalent to the amount of local currency made available by the Grantee, which dollars will be utilized for procurement from the United States under appropriate procedures described in Project Implementation Letters.

The U.S. dollar equivalent of the local currency made available hereunder will be, in the case of subsection (b) (1) above, the amount of U.S. dollars required by USAID to obtain the local currency, and in the case of subsection (b) (2) above, an amount calculated at the rate of exchange specified in the applicable Special Letter of Credit Implementation Memorandum hereunder as of the date of the opening or amendment of the applicable Special Letter of Credit.

7.3 Other Forms of Disbursement

Disbursements of the Grant may also be made through such other means as the Parties may agree to in writing.

7.4 Rate of Exchange

Except as may be more specifically provided under Section 7.2 if funds provided under the Grant are introduced into Togo by USAID or any public or private agency for purposes of carrying out obligations of USAID hereunder, the Grantee will make such arrangements as may be necessary so that such funds may be converted into currency of Togo at the highest rate of exchange which, at the time the conversion is made, is not unlawful in Togo.

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Article 8

Miscellaneous

8.1 Investment Guaranty Project Approved

Construction work to be financed under this Agreement is agreed to be a project approved by Togo pursuant to the Agreement between it and the United States of America on the subject of investment guaranties, and no further approval by Togo will be required to permit the United States to issue investment guaranties under that agreement covering a contractor's investment in that project.

8.2 Communications

Any notice request, document, or other communication submitted by either Party to the other under this Agreement will be in writing or by telegram or cable, and will be deemed duly given or sent when delivered to such party at the following addresses:

To the Grantee:

Mail Address: Ministry of Plan and
Administrative Reform
Lome, Togo

To USAID:

Mail Address: Embassy of the U.S.A.
Lome, Togo

All such communications will be in French, unless the Parties otherwise agree in writing. Other addresses may be substituted for the above upon the giving of notice.

8.3 Representatives

For all purposes relevant to this Agreement, the Grantee will be represented by the individual holding or acting in the office of the Minister of Plan and Administrative Reform and USAID will be represented by the individual holding or acting in the office of the USAID Representative, each of whom by written notice, may designate additional representatives for all purposes other than exercising the power under Section 2.1 to revise elements of the amplified description in Annex 1. The names of the representatives of the Grantee, with specimen signatures, will be provided to USAID, which may accept as duly authorized any instrument signed by such representatives in implementation of this Agreement, until receipt of written notice of revocation of their authority.

8.4 Standard Provisions Annex:

A " Project Grant Standard Provisions Annex" (Annex 2) is attached to and forms part of this Agreement.

8.5 Language of Agreement

This Agreement is prepared in both French and English. In the event of ambiguity or conflict between the two versions, the English Language version will control.

IN WITNESS WHEREOF, the Grantee and the United States of America, each acting through its duly authorized representative, have caused this Agreement to be signed in their names and delivered as of the day and year first above written.

REPUBLIC OF TOGO

By:
Title: Minister of Economy and Finances

UNITED STATES OF AMERICA

By:
Title: Ambassador of the United States of America

United States of America

By:
Title: USAID Representative

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ANNEX SEVENTEEN (cont) PROJECT DESCRIPTION

INTRODUCTION

This Agreement presents the U.S. response to the request of the Togolese Government to support its major rural development initative in concert with anticipated funding by other donors. A total of $ 4,990,000 in grant assistance is planned over a period of 5 1/2 years from the late 1982 to early 1988. The categories of assistance will include a) institution building, b) training, c) development of extension activities, d) supply of animal traction units and directly related support services, and e) technical advisory services.

BACKGROUND

During the 1970's, Togolese agricultural policy was dominated by the conviction that real improvement in agriculture was only possible through motorized mechanization and the commercialization of production. A great deal of political energy and economic resources were expended in this pursuit. By the late 1970's, it was increasingly apparent that tractors did not respond to the needs of smallholder agriculture in Togo. The GOT, openly acknowledging this, has since launched a major public initiative to introduce, expand and support the use of animal traction technology by smallholder farmers.

Parallel to the experience with tractors, a number of much more modest attempts were being made to introduce animal traction during the 1970's. U.S. involvement in animal traction in Togo began in 1971 when the Kara regional rural development organization (SORAD then, DRDR now), some Peace Corps volunteers and the U.S.Ambassador's Self-Help Fund began a pilot program to introduce animal traction to smallholders. By 1979, some 30 units of oxen and equipment had been sold on credit. Togo Animal Traction, an AIP, was funded in 1978 and began implementation in 1979. This activity involved 4 villages staffed with Peace Corps Volunteers, and the building of a logistics and training center at Agbassa. By 1982, some 90 animal traction units have been distributed on credit.

This continuous, though modest, U.S. involvement has earned a certain credibiltity in the thinking of the GOT and of other projects for U.S. assistance to agriculture and to the expansion of animal traction in particular. The recent strong GOT rural development initiative in support of animal traction has prompted the design and implementation of a great number of donor-assisted animal traction projects. With so much activity,

so many different donors, and so many different project strategies, the GOT has recognized an increasing need for the standardization and coordination of animal traction policy and strategies.

GOAL, PURPOSE AND OBJECTIVES

1. Project Goal

The goal of the AID Togo Animal Traction Development Project (TAT) is to increase the agricultural production and incomes of Togolese smallholder farmers.

2. Project Purpose

The purpose of TAT is to restructure, coordinate and harmonize animal traction extension in Togo through:
a) strengthening the newly created National Animal Traction Program (PROPTA) and its ability to deliver services in the areas of animal supply, training, credit and monitoring, and evaluation.
b) the creation of Extension Support Centers (CAT's) in the two northern regions of Kara and Savanes to work with farmers and agro-pastoralists in animal traction.

3. Project Objectives

The objectives of TAT are to:

a) develop a national system for the acquisition and delivery of work animals,

b) develop training courses in animal traction for field staff and administer those courses to TAT extension staff,

c) develop methodologies for monitoring and evaluating animal traction projects and carry them out for the TAT project,

d) standardize and coordinate the administration of medium-term animal traction credit programs with the National Agricultural Credit Bank (CNCA),

e) establish 10 Extension Support Centers and train their staff,

f) introduce 500 farmers to the use of animal traction,

g) create two pilot herds to study possibilities for the improvement of extensive livestock production practices,

h) conduct a program of applied research on cropping packages and farming systems using animal traction.

PROJECT INPUTS AND OUTPUTS

This project will work at a number of levels towards a range of objectives. This means that different activities will be operative at different levels (national, regional, local) and at different times. For this reason, the design team feels it is necessary to conceptualize the project's life in phases which reflect the combination and coordination of the various project activities. This is also why the PP calls for 5 1/2 years instead of 5 years as stated in the PID. If the project were to terminate in the fall of 1987, and the technical advisors were to leave at this time, the results of the last cropping season (harvest is in December) would not be available for interpretation and analysis. This would effectively reduce the project to a four year life.

1982 - 83: Interim Phase (PY 1)

There are essentially three reasons for this phase. Given the administrative requirements of contracting, it is unlikely that the technical assistance team will arrive much before August, 1983. The construction program (animal buying center, extension support centers, office block) will not be completed much before August, 1983. The National Animal Traction Program (PROPTA) is about to be created, but likely will not be operative until sometime in 1983. Consequently, the first year of the project will be an interim period between the AIP and the arrival of the technical assistance team. An Interim Project Coordinator will be responsible for monitoring the construction program, continuing and expanding the program which was begun under the AIP activity, and for initiating commodity procurement.

1983 - 1985: Second Phase (PY 2, PY 3)

The full technical assistance team will arrive at the end of project year one. The construction program and commodity procurement should be largely completed. The technical advisors will develop programs of work for various project activities and initiate them. By the end of this phase, preliminary results will be forthcoming. Any redesign of project activities should occur by the end of this phase.

1985 - 1988: Third Phase (PY 4, PY 5, PY 5 1/2)

All project activities will be fully functional. Efforts should

begin in order to shift responsibility, support and maintenance progressively to the GOT.

This above brief presentation of phasing project activities permits project infrastructure to be installed before technical advisors arrive. It explicitly recognizes the eventual possibility of redesigning certain project activities. It allows for the transition to full GOT management and support, and provides for the full benefit of the last year of project life.

PROJECT INPUTS

The major areas of AID inputs are Technical Assistance, Commodity Procurement, Construction, and Operating Costs. Particular to the project is an allocation to establish a series of revolving funds (see detailed budgets in Annexes Two and Ten).

Under Technical Assistance, 14 person-years of long-term assistance and 11 person-months of short-term assistance are funded. There are also 5 person-months funded as part of the planned external evaluations. Total technical Assistance is $ 1.966,170.

Under Commodity Procurement, 4-wheeled vehicles have been funded for the Technical Assistance and 2-wheeled vehicles for the extension staff. Equipment will be procured for the animal buying center and the extension support centers. The PROPTA Training and Monitoring and Evaluation Units are also being funded for specialized equipment. Office equipment is being procured for all offices directly related to TAT activities. The total Commodity Procurement budget item is $ 400,445.

The Construction Program includes a central office block for TAT in Kara, the GOT's project director's residence, additional housing at the Agbassa Center, the entire animal buying center installations at Tantiegou and the construction of 10 Extension Support Centers. Costs for water wells at the centers have been set aside, although it is hoped that either the AID bilateral Rural Water Supply Project or other donors might contribute towards drilling and equiping the wells. The total Construction Program Budget item is $ 412,550.

The Operating Cost budget covers vehicle functioning costs and office operations. There are also funds set aside for those training programs administered in the two northers regions under TAT. Total Operating Costs budgeted are $ 381,340.

There are three Revolving Funds to be financed by the project. The two separate accounts for animal purchase and equipment purchse will permit the two northern DRDR's to make animal traction units available to

TAT farmers on credit. The veterinary revolving fund has two purposes. It will permit the DRDR's to guarantee the supply of veterinary products to TAT farmers. It will also permit PROPTA to create two pilot herds which, through natural herd turnover, will be financially self-sufficient. The Revolving Funds amount to $ 575,000.

Finally, a contingency factor of 10% of project costs has been included and amounts to $ 373,535. A rate of 12% has been used for inflation and amounts to $ 881,694. The total USAID budget contribution is $ 4,990,000.

GOT CONTRIBUTIONS

A total GOT contribution to AID-TAT activities of $ 1,670,000 consists mostly of personnel costs ($526,152) and operating costs ($ 283,570). A number of vehicles will be provided by the GOT ($ 200,250) as well as some construction costs ($ 100,000). The same factor applied to the AID funds have been used for contingency allowances ($ 111,015) and inflation ($ 448,054).

OTHER CONTRIBUTIONS

Direct participation in TAT is also provided by Peace Corps. Each of the Extension Support Centers will benefit from technical resources and coordination support supplied by a trained Peace Corps Volunteer. The animal buying center will be staffed with a volunteer. A construction volunteer will be assigned to the project to oversee the smaller construction sites. Finally, three volunteers will be assigned to coordinate animal traction training programs at three centers: Tantiegou, Agbassa and Kamina.

PROJECT OUTPUTS

A summary is presented below:

1. The national animal buying system will be established with working procedures for animal health care and mantenance. The national buying center (Tantiegou) will have the capacity to handle 2000 animals per year. A buying out-center will be established at Agbassa.

2. The PROPTA Monitoring and Evaluation Unit will have the capacity to collect, analyze and interpret farm and project level data on the economic and financial impacts of animal traction.

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3. The PROPTA Training Unit will have the capacity to produce training modules on a variety of topics in animal traction.

4. PROPTA headquarters for the north will be established and coordinate animal and equipment needs with other projects.

5. PROPTA pilot herds will begin to generate preliminary indications for improvements in livestock management using extension grazing techniques.

6. Procedures for running the Revolving Funds with the DRDR's, CNCA and the Veterinary Service will be established and operative.

7. The 10 Extension Support Centers will be established and supply support and technical services to animal traction farmers. They will also be carrying on demonstrations of animal traction techniques and doing some limited adaptive field testing of alternative cropping systems and alternative cropping operations.

8. The animal insurance and health care program will be established. All farmers introduced to animal traction (500) through TAT will be participating.

9. The CNCA will have developed the capacity to monitor animal traction loan portfolios. The procedures for repayment, default and foreclosure will be adhered to by all TAT farmers.

PROJECT EVALUATIONS

Project evaluations will be held yearly and are intended to be more than a mere listing of the past year's doings, as well as a projection of the next year's activities. The evaluations will iclude the following points:

a) Evaluation of progress towards attainment of project objectives,

b) Identification of problem areas that my hinder attainment of objectives,

c) Assessment of how information can be applied towards redressment of project,

d) Evaluation, to the degree feasible, of the overall impact of the project.

These evaluations are not limited to project technicians and outside consultants, but should include participation from GOT Ministries concerned, AID/Togo and appropriate technicians from REDSO/WA. The purpose of the internal evaluations is to take stock of the various project activities, discuss the arguments for adjustments in the direction of any of these activities, and to lay out detailed plans of work for the coming year.

REPORTS

The Government of Togo will submit to USAID quarterly and annual reports during the course of the Project, and a comprehensive report at the end of the Project.

PROJECT FUNDING SUMMARY

($000)

	AID Total	AID US	AID LC	GOT	TOTAL
TA:					
Long-term	1,778	1,568	210		1,778
Short-term	116	106	10		116
Evaluation	72	50	22		72
LOCAL PERSONNEL:				526	526
COMMODITIES:					
Vehicles	164	-	164	190	354
Animal/Farm	35	13	22		35
Veterinary	17	4	13		17
Training	50	15	35		50
Survey	50	15	35		50
Office/Furniture	84	54	30	5	89
Construction materials				100	100
CONSTRUCTION:					
Kara	91	-	91		91
Agbassa	7	-	7		7
Tantiegou	64	-	64		64
CATs	180	-	180		180
Wells	70	-	70		70
REVOLVING FUNDS:					
Animals	300	-	300		300
Equipment	250	-	250		250
Veterinary	25	-	25		25
OPERATING COSTS:	382	65	317	275	657
TOTAL	3,735	1,890	1,845	1,096	4,831
CONTINGENCIES	374	189	185	110	484
INFLATION	881	445	436	464	1,345
TOTAL	4,990	2,524	2,466	1,670	6,660