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: Ethiopia

4. DOCUMENT REVISION NUMBER:

5. PROJECT NUMBER (7 digits): 663-0182

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

7. PROJECT TITLE (Maximum 40 characters): Rural Roads

8. ESTIMATED FY OF PROJECT COMPLETION: FY 81

9. ESTIMATED DATE OF OBLIGATION: A. INITIAL FY 77; B. QUARTER 4 (Enter 1, 2, 3, or 4); C. FINAL FY 77

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	7,097	896	7,993	7,097	896	7,993
(GRANT)	(7,097)	(896)	(7,993)	(7,097)	(896)	(7,993)
(LOAN)	( )	( )	( )	( )	( )	( )
OTHER U.S. 1.						
OTHER U.S. 2.						
HOST COUNTRY	1,277	6,853	8,130	1,277	6,853	8,130
OTHER DONOR(S)						
TOTALS	8,374	7,749	16,123	8,374	7,749	16,123

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 77 F. GRANT	E. 1ST FY 77 G. LOAN	H. 2ND FY ___ I. GRANT	H. 2ND FY ___ J. LOAN	K. 3RD FY ___ L. GRANT	K. 3RD FY ___ M. LOAN
(1) FN	201	821		7,993					
(2)									
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(4)									
			TOTALS	7,993					

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12. IN-DEPTH EVALUATION SCHEDULED: MM 6 YY 78

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 = NO, 2 = YES)

NOTE: Original PRP prepared Jan. 16, 1975 prior to use of current format.

14. ORIGINATING OFFICE CLEARANCE

SIGNATURE: Frank Ingram

TITLE: Director

DATE SIGNED: MM 07 DD 11 YY 77

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

AID 1330-4 (3-76)

PROJECT PAPER

RURAL ROADS

Project Number
663-0182

USAID/Ethiopia
July 14, 1977

"I am thinking particularly at this moment of Ethiopia which must be the most difficult place in God's world to ever provide any roads..."*

"For would-be road builders, Ethiopia can be viewed as either a nightmare or an extraordinary challenge."**

---

* Congressman Clarence Long. AID Hearings, March 15, 1977.

** Burns, Robert "The Current Controvery Over Low Cost Road Construction in Developing Countries". (Mimeo, 1975 p. 5) (Extensive use has been made of this thoughtful analysis and it should be read, if possible, in conjunction with this Project Paper. Mr. Burns is presently with the World Bank.)

LIST OF ABBREVIATIONS

A

ADT	Average Daily Traffic
AFDB	African Development Bank

B

C

CIDA	Canadian International Development Agency
CA	Crown Agents
C/M	Construction & Maintenance
CSO	Central Statistics Office
CP	Congressional Presentation

D

DF	Discount Factor
DAP	Di-ammonium Phosphate

E

EFY	Ethiopian Fiscal Year
ERA	Ethiopian Road Authority
EPMG	Ethiopian Provisional Military Government
EPID	Extension Project Implementation Department
EDF	European Development Fund
EWNHS	Ethiopian Wildlife and Natural History Society

F

FX	Foreign Exchange
FAR	Fixed Amount Reimbursement

G

GDP	Gross Domestic Product

H

HERF	Highway Equipment Repair Facility

I

IDA	International Development Association
IBRD	International Bank for Reconstruction and Development
IEE	Initial Invironmental Examination
IFB	Invitation for Bids

J

K

KFW Kreditanstalt Fur Wiederaufbau

L

M

MPP II Minimum Package Program Phase II
MT Metric Ton

N

NPV Net Present Value

O

ODM
O&M Organization and Management

P

PRRO Provincial Rural Roads Organization
PES Project Evaluation Summary
PA Peasant Association
PPD Planning and Programming Department
PCO Planning Commission Office
PRRC Provincial Rural Roads Committee
PRRE Provincial Rural Roads Engineer
POL Petroleum, Oil, Lubricants
POMOA Provisional Office for Mass Organization Affairs
PRDC Provincial Revolutionary Development Committee
PIO Project Implementation Order

Q

Qt Quintal (1/10th Metric Ton)

R

RPA Rural Projects Agency
RFP Request for Proposals
RRO Rural Roads Organization
RLDC Relatively Least Developed Country
RRTF Rural Roads Task Force
RR Rural Road
RRC Relief and Rehabilitation Commission
RRD Rural Roads Division

S

SIDA Swedish International Development Authority

T

TPU Training Production Unit

U

V

VPD Vehicles Per Day

NOTE:

1. During the drafting of this paper the official English spelling Gamo Goffa was adopted by the EPMG in lieu of the Gemu Gofa used herein.

2. The terms "Province" and "Administrative Region" are used interchangeably. The latter is the present official designation of the country's 14 former Provinces.

PROJECT PAPER

RURAL ROADS

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O Maps

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SIGNATURE: Prudence Ingram

TITLE: Director

DATE SIGNED: MM 07 DD 14 YY 77

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

AID 1330-4 (3-76)

B. Recommendations

The following actions are being submitted for approval in this Project Paper.

Grant	$8,000,000
Total new AID obligations	$8,000,000

- Waiver for Code 935 Procurement of selected items of equipment (tipping trailers).
- Waiver of FAA Section 110(b) 3 Year time limit on disbursements for capital grant.

C. Description of the Project

1. General

This project provides technical expertise, on-the-job and third country training, equipment and selective local cost support to enhance the Ethiopian Provisional Military Government's capability to build and maintain low cost, low standard roads in nearly inaccessible parts of rural Ethiopia. The project is a component of a $103.6 million 5-Year Rural Roads Program (EFY*1970-1974) which is also being assisted by the World Bank's International Development Association and, possibly in the future, other donors as well.

During the course of the 3-Year AID-financed component of the project the following will occur:

a. A Rural Roads Organization (RRO) will begin functioning as a semi-autonomous unit of the Ethiopian Road Authority (ERA).

b. RRO responsibilities for construction and maintenance of rural roads will be gradually devolved from its Central Headquarters to Provincial Rural Roads Offices (PRROs).

c. Provincial Construction and Maintenance Units will be established in nearly all Provinces; at first under Central Headquarters direction, but eventually under PRRO direction.

d. AID will provide assistance in establishing construction and maintenance units in Gojjam and Gemu Gofa Province. Over the course of the 3-Year Project the PRROs will gradually grow to approximately 75% of full strength and a total of approximately 626 kms of rural road will be constructed. Substantially more will come under the maintenance programs of the two provinces.

*Ethiopian Fiscal Year began July 8, 1977.

e. The ERA training program will double its size with general IDA assistance and selected assistance from AID in rural roads related training.

f. A program providing technical training and some equipment assistance to rural Peasant Associations for self-help road construction will be established and approximately 200 kms of these roads will be constructed in Gemu Gofa and Gojjam over 3 years.

g. In support of the above, AID will supply 9 person-years of technical expertise and approximately 135 person-months of short-term training in other developing countries.

2. Organization and Implementation Responsibilities

a. Ethiopian Government

The leadership of the RRO will have initial principal responsibility for carrying out the project in the two Provinces, and for managing the technical assistance and training aspects at the center. As skilled people are trained and assigned to the provincial offices the latter will assume a gradually increasing share of the planning and implementation of the project activities in each province. The PRRO will be guided by the Provincial Rural Roads Committee composed of representatives of Peasant Associations and development agencies with activities in the province.

Commodity procurement will be the responsibility of ERA, as will major repairs of equipment. RRO will be responsible for the rural roads component of the training program, personnel and local procurement of goods and services.

b. AID

USAID/Ethiopia will provide monitoring and evaluation support. AID/W will be requested to secure the services of an U.S. firm experienced with rural road construction to provide the technical expertise under an AID Direct Contract. REDSO/EA will be requested to provide engineering services.

3. Methods to Help Assure Successful Accomplishment of Project Objectives

a. Planning

The plan of the project has involved local provincial representatives, the British Crown Agents, the Ethiopian Government's Rural Roads

Working Group and Rural Roads Task Force, ERA, IBRD and AID. The components of the AID project have been carefully designed and the inputs and timing are sufficient to meet the project objectives. The most likely problem area will be the recruitment of skilled staff for the Provincial Offices. Ethiopian Government officials are confident, however, that the combination of graduates from the University and the technical schools, plus the doubling of capacity of the ERA training facility (with special programs for rural roads) will provide a sufficient number of recruits for these positions.

b. Implementation

The detailed implementation plan will be finalized prior to signing the Grant Agreement and will be made a part of Agreement by reference (or, if this is not possible, not later than 60 days subsequent to signing the Agreement). During the course of implementation a serious monitoring effort will be undertaken so that any potentially serious impediments will be diagnosed before they are able to impede project progress to any marked degree. A PES evaluation is scheduled for the ninth month after signing the Grant Agreement to determine whether all the start-up arrangements are proceeding according to schedule.

4. End of Project Status

a. Decentralization

The RRO will have been functioning for approximately three years. During that time the management of the processes of road construction, maintenance, assistance on self-help roads and (soon after the end of the 3-Year project period) selection of roads for construction will have been largely devolved to Provincial Rural Roads Offices and the Provincial Rural Roads Committees.

b. Construction and Maintenance

By the end of the project an estimated 626 kms of road will have been constructed by the Provincial Construction Units in Gemu Gofa and Gojjam. These roads and approximately 700 kms of additional road will be included in regular maintenance programs of the Provincial Maintenance Units. In addition, approximately 200 kms of self-help roads would have been constructed. Government programs such as the Minimum Package Program (Phase II), the Grain Storage and Marketing Program, the Work Oriented Adult Education Program, Rural Basic Health Services, and others (including Malaria and Tsetse control) will have started operating in many areas opened up by the road construction program.

D. Summary Findings

On the basis of the analyses contained herein, the project is determined to be economically, technically, socially and financially feasible. The project is ready for implementation. It is recommended that a Grant to the Provisional Military Government of Socialist Ethiopia be authorized in the amount of US$ 8,000,000.

The project meets all applicable statutory criteria. (See Statutory Checklist, Annex I.) The Mission Director's 611(e) Certification is attached as Annex J.

E. Project Issues

Five issues were raised in the ECPR. The issues and where they are addressed in the PP are:

1. What sort of Government Institutions should preside over the planning, financing and constructing of low cost roads?

   a. This issue is addressed in Section II. A., B. and Annex B.

2. How should periodic maintenance be provided?

   a. Addressed in sections II. A., B. and Annex B.

3. To what engineering standards should a particular road be built?

   a. Addressed in Annex B.

4. How should projects be selected and priorities set?

   a. Addressed in sections II. B., III. C., D., and Annexes E, G and M.

5. What techniques should be employed to construct such roads?

   a. Addressed in sections II. B., Annexes B and G.

II. PROJECT BACKGROUND AND DETAILED DESCRIPTION

A. Background

Ethiopia, with an estimated 1977 population of nearly 30,000,000 is the third most populous country in Africa and, by any standard, one of the poorest countries on earth. The average per capita GDP is substantially less than $100; and that for the rural peasantry is far less than the national average. It has been estimated that average per capita agricultural productivity has grown in recent years by not more than 2 percent yearly while the annual population growth rate is about 2.5 percent. Under these conditions, each new pair of arms born in Ethiopia does not produce enough food to feed the attached mouth.

Yet, unlike many of Relatively Least Developed Countries (RLDCs), Ethiopia has considerable potential to expand total food production and per capita productivity. There is an estimated 733,000 square kilometers of fertile productive land presently under cultivation or available for production in the highlands and another 489,000 square kilometers of productive or potentially productive land in lower elevations. Ethiopia has the potential in terms of its land resources to feed not only its own expanding population but under ideal circumstances become a net exporter. The crucial challenge is to overcome the long-standing impediments to increased production and productivity in ways which will benefit the estimated 90 percent of Ethiopians who derive their livelihood from agriculture.

As indicated in the DAP, the constraints on development in the sector are numerous, overlapping and mutually reinforcing. Six were listed. Of those, five remain unabated: (1) lack of rural roads; (2) administrative and manpower problems; (3) availability of modern inputs, (4) agriculture marketing problems; and (5) lack of research and information. (The sixth impediment--the need for land reform--has been eliminated as a constraint by the land reform programs implemented since late 1974 by the Ethiopian Provisional Military Government - EPMG.)

This project is aimed at eventual elimination of the first of these constraints. The lack of rural roads in Ethiopia is most strikingly apparent when flying over the country in a small aircraft. In many places an hour's flight in a straight line will not reveal a single motorable road. About two-thirds of rural Ethiopians live too far from a road to use it or derive meaningful benefits from it. Though but one of many obstacles to the improvement of the lives of Ethiopia's rural population, the lack of rural roads is one of the most critical. Rural roads constitute almost certainly a necessary though, arguably,

not a sufficient condition for rural development. Nevertheless, rural development cannot occur as readily or as rapidly in the absence of rural roads. It is the view of the Ethiopian Government*, the World Bank Group**, AID*** and numerous other donors that expansion of rural roads must receive high priority both from the Ethiopian Government and from the donors as well.

1. The Road System****

Ethiopia has a very limited transport network with roads being by far the most important form. In 1935 when the Italian occupation temporarily ended Ethiopia's centuries-long independence from foreign domination, there were less than 1,000 km of roads and drivable tracks in existence. The rugged terrain of the Empire had made it next to impossible to construct roads without heavy-duty equipment. The Fascist invadors, coming mainly from the then Italian colony of Somalia, literally built their own roads as they went along.

After the six year Italian occupation, the road net had been expanded to 6,000 km mostly in the highlands. These roads, upgraded over the years, still serve as the nucleus of the present system of 8,800 kms of all-weather roads and 31,000 kms of dry-weather trails and tracks.

Although serving as the dominant form of transport, the road density is 19 km per 1,000 km^2 and vehicle density is less than 2 vehicles per 1,000 persons (one of the lowest vehicle/person densities in Africa). Nevertheless, the World Bank estimates that about 95 percent of non-urban passenger traffic and about 90 percent of the non-urban freight traffic is carried by road. Two-thirds of the country's foreign trade moves by road to and from the ports of Assab, Massawa and Djibouti, the rest being carried on Ethiopia's only currently operational railroad (which, as of this writing, has been interdicted by sabotage), linking Addis Ababa and Djibouti.

---

* IEG, PCO "Local Rural Roads Program in Ethiopia" Vol. 1 (Addis Ababa, Feb., 1973)

** IBRD (IDA) "Agriculture Sector Survey: Ethiopia" Vol. III, Annex 22 (Washington, Jan., 1973)

*** Rural Roads Project Review Paper (Dec., 1975)

**** The following brief description relies in part from the World Bank's Report No. 14166-ET ("Appraisal of a Road Sector Project - Ethiopia") and No. P-20007-ET ("Report and Recommendation of the President of the International Development Association to the Executive Directors on a Proposed Credit to Ethiopia for a Road Sector Project"). Both dated April 28, 1977.

The construction of roads in much of Ethiopia is both costly and difficult because of the fractured terrain and heavy rainy seasons in much of the country. As a result many of the areas of the countryside remain isolated and dependent upon pack animals and human carriers for transport. The fact that only about 25 percent of the country's total agricultural production is marketed can be attributed in part to this lack of roads in the rural areas.

Beginning in 1951 and continuing to the present, the Ethiopian Government has been expanding and upgrading its basic road net. The engineering standards used (borrowed from the U.S. Bureau of Public Roads which provided technical guidance and management until the early 1960s) were normally those meant for roads of high traffic volume; while, in fact, traffic counts in excess of 500 vehicles per day were, and remain, rare on Ethiopian trunk roads. Even so, the main network still requires considerable upgrading and extension.

Responsibility for construction and maintenance of the core road system (ranging from primary roads to feeder roads but not including, until recently, rural roads) was the responsibility of the old Imperial Highway Authority (renamed the Ethiopian Road Authority in 1975), which received assistance from AID and predecessor agencies throughout the 1950s, 60s and early 70s amounting to more than $45 million. The World Bank has provided more than $100 million in assistance for trunk roads until the late 1960s and for various categories of agricultural roads since then.

2. Ethiopian Road Authority (ERA)

The ERA is presently responsible for the 8,800 km of road in the main network categorized as primary, secondary and feeder or tertiary - a classification more related to design standards than function. It is an autonomous organization under the umbrella of the Ministry of Transport and Communication. It is supervised by a Board of Commissioners composed of: The Minister of Transport and Communications (Chairman), the Permanent Secretaries of Finance and Commerce and Industry, the General Manager of ERA and one additional member. All ERA divisions are now headed by qualified Ethiopians and, while there are still critical staff shortages at several levels within the organization, ERA has been successfully "Ethiopianized" and functions satisfactorily.

Planning and engineering for the main road system is the responsibility of the Planning and Programming Division (PPD) which also develops the annual budget submission to the Planning Commission and Ministry of Finance. (Total ERA capital and recurrent budgeted expenditures have averaged 11 percent of the total Government budget since 1971. Capital expenditures in 1976 were $48 million--more than double the 1974 level.)

Decision making with regard to the main road network is normally based upon feasibility studies incorporating preliminary engineering, suggested standards and economic analysis undertaken by PPD. Once the decision is taken to construct a road, detailed engineering is undertaken by ERA's Design Division. This division has, for several years, been capable of producing highway designs of international standard.

In construction, ERA employs both contracts and force account methods. Major contracts are unit-price, awarded on the basis of international competitive bidding after prequalification of contractors. Since 1972, with assistance from IDA, ERA has made efforts to expand and improve the indigenous construction industry. About two-thirds of all road construction in Ethiopia is done by contractors and one-third by ERA force account. By the end of 1977, ERA will have five force account units each capable of constructing about 50 km of new gravel roads per year; two asphalting upgrading units, each capable of 70 kms/year; and one asphalt overlay crew capable of about 150 km/year. The capability of the ERA force account staff has improved considerably in recent years with World Bank assistance.

Maintenance of the main road network is the responsibility of the Operations Division, within which the Roads Maintenance Engineer has overall responsibility for maintenance in all of ERA's nine districts. The scheduling of maintenance and related budget preparation has been delegated to the districts. Considerably improved maintenance in recent years is in part attributable to ERA follow-up action on the AID-financed 1973 Road Maintenance Study by F. R. Harris, Inc., an American consulting firm. This study identified road maintenance priorities and the equipment and manpower necessary to implement a Road Maintenance Program through 1982. The required equipment has been procured with assistance from IDA, AID and ODM. In addition, AID financed a Highway Equipment Repair Facilities (HERF) project (completed in 1975) which constructed or expanded road equipment workshops in each district.

Increased maintenance demands created by a constantly expanding equipment fleet has put a severe strain on the existing maintenance capability. Much of the existing manpower force still retains a relatively low skill level in the districts and there is a shortage of equipment operators and shop personnel. During the 1978-82 period, IDA will provide training assistance to help overcome this problem.

Training of ERA personnel is accomplished at basically three levels. Senior professional personnel have been trained at technical schools and universities in Ethiopia and abroad. Middle and lower level

skilled administrative, construction and maintenance personnel are trained, re-trained and upgraded at ERA's Alemgena Training Center near Addis Ababa. Since 1956, more than 5,000 foremen, technicians and equipment operators have been trained at Alemgena. Finally, there has been considerable on-the-job training carried out at construction and maintenance sites by expatriate and Ethiopian senior and middle-level staff.

The need for trained personnel, however, still continues to exceed supply and a considerable expansion of training at all levels is planned for 1978-82 and beyond.

3. Rural Roads

Since its inception, ERA has concentrated almost entirely on the main road network. Rural roads--all roads lower than feeder road standard--were neglected by the GOE until the early 1970s and although such roads were being built by several entities in Ethiopia, construction was normally haphazard, often unprofessional and uncoordinated. Maintenance was virtually unknown. No central government agency had responsibility for rural roads.

The Ethiopian Government's Third Five Year Plan in 1968 stressed, for the first time, the need for a dramatic expansion in rural road construction to promote agriculture and rural development. The Plan called for construction of three types of road not previously part of the government's construction program: (1) low-cost penetration roads (relatively long roads passing through regions of potential development); (2) provincial roads (connecting awraja capitals) and; (3) feeder/access roads (relatively short roads linking specific areas to market centers or to main roads leading to these centers). Through 1972, very little actual construction occurred on these classes of rural roads and it was at this point that the Planning Commission Office (PCO) organized a Working Group on Local Rural Roads Development with representatives from PCO, interested ministries, the Highway Authority, Chilalo Agriculture Development Unit and from several donors including AID to study the problems impeding the development of a rural roads program and to make recommendations for the organization and methodology for a national rural roads program.

In its February, 1973 final report the Working Group concluded that:

1. An organization should be established with responsibility for planning, constructing and maintaining rural roads, and the objective should be ultimate decentralization of this responsibility to the awraja or lower level, with only minimal control by the central government;

2. rural roads should be constructed to the minimum standard necessary for motorized vehicles and no such road should be built unless there is reasonable certainty of maintenance;

3. construction and maintenance methods should be as labor intensive as possible to generate employment opportunities for rural dwellers, and;

4. a rural roads task force (RRTF) should be established to follow-up the pregoing recommendations.

The events of 1973 and 1974 in Ethiopia including the drought, widespread strikes, and eventually the Ethiopian Revolution itself, slowed but did not stop Government activity resulting from the Working Group's Report. The RRTF was established consisting of representatives from the Ministries of Agriculture, Interior, Finance, the PCO, ERA and ERA's General Manager as Chairman and its Rural Roads Coordinator (subsequently head of the Rural Roads Division) as Secretary. Largely as a result of the drought and the need to construct access roads to stricken areas in Wello, Tigre, Hararghe, Bale, Sidamo and Gemu Gofa Provinces (now Administrative Regions) a Rural Roads Division was constituted within ERA with the mandate to construct and maintain low cost, low standard drought-related rural roads.

The objectives of the RRTF were to:

1. identify the appropriate organization and administrative procedures for a locally-based, labor intensive rural roads program;

2. specify a schedule for building up the requisite organization, resources and supporting information, and;

3. draw up a program for rural roads construction and maintenance and identify the resources necessary to implement it.

Utilizing funds eventually provided by ODM and IDA, the RRTF contracted with the Crown Agents (UK) to undertake a comprehensive study with the terms of reference for the study agreed upon by ODM, IDA and the Government. The Crown Agents' final report which provides the basis for the Government's 1978-82 Rural Road Program was completed during the period September, 1976 through January, 1977.

Meanwhile, ERA was deeply engaged in its own Highway Sector Program planning for 1978-82 (Ethiopian Financial Years 1970-74) which was published as a Plan in January, 1977. One volume of the Highway Sector Program specifically entitled "Rural Roads Component" was prepared by ERA's Rural Roads Division and is, basically, the Ethiopian Government's five year plan for rural road development for the period 1978-82.

B. Detailed Project Description

1. The Ethiopian Government's Rural Roads Program

AID, in concert with IDA and other donors, will provide assistance to the Ethiopian Government for the rural roads component of the 1978-82 Highway Sector Program. This five-year program aims at the construction of 6,350 kms of rural roads in 106 separate projects located in all 14 administrative regions of the country plus the expansion of maintenance from an initial 787 kms in 1978 to 7,400 kms in 1982. The individual projects have been selected based on recommendations of EPID (Extension Project Implementation Division--the agency of the Ministry of Agriculture responsible for the Minimum Package Program), the Relief and Rehabilitation Commission, the Crown Agents and the (ad hoc) Provincial Rural Roads Committees.

a. Standards

The roads are to be built to one of three sets of standards based upon the estimated average daily traffice (ADT) levels which would occur over the next several years. The majority of roads will be built to an ADT 10 standard (called RR10 roads) which would be capable of carrying 10 vehicles per day (VPD) during the dry season and would be closed to traffic during the rainy season. The second class of roads, RR30, would afford limited wet weather capacity for light traffic and a normal capacity of 30 VPD. The third category, RR50, is an all-weather, gravel-surfaced road with better drainage and more bridges than RR30 roads. (For the detailed standards, see Annex B.)

It should be noted that these standards represent the recommendations of the Crown Agents as slightly modified by the RRTF. In the AID-financed portion of the program discussed in the Technical Analysis Section (Annex B), some modification in these standards has been recommended by the AID consultants, Louis Berger International based upon visual inspection of certain of the roads proposed for construction (or, in some cases, "reconstitution") under AID financing.

It should also be noted that there has been a lingering debate over the need for 6m formation widths for the minimal standard RR10 roads. Some donor personnel have argued that a 4m formation width with 6m passing places every several hundred meters is adequate and less costly. USAID/ Ethiopia and its consultants, Louis Berger, do not agree with the 4m argument, however, for the following reasons:

- Actual experience with the 4m roads in Ethiopia (some EPID roads, constructed with SIDA support have been at the 4m width) have shown that traffic does not use the 6m passing places, but attempts to pass on the 4m stretches with consequent rapid deterioration of the shoulders and longitudinal drainage.

- The longitudinal drainage is more difficult to construct and is not as effective because of the need to divert around the 6m passing places.

- In all but difficult mountainous terrain, the difference in cost between the 6m and 4m formation widths is not great for the RR10 roads. In places where deep rock cutting is required the RR10 standard calls for reduction to the 4m width anyway.

- In cases where RR10 roads are eventually upgraded to higher standard, an original 4m formation width requires considerable more difficulty and expense in redesign to a 6m width.

For the above reasons, AID concurs with the 6m formation width for RR10 roads.

b. Category of Rural Roads

The selection of roads to be included in the first five year program and the prioritization of roads within the group planned for construction within the first five year period was accomplished by the RRTF relying heavily, but by no means entirely, upon some of the methodology of the Crown Agents in determining their own recommendations. Four groups of roads are to be included as part of the rural roads program:

1) Self-Help Rural Roads

Roads initiated by peasant associations (PAs), largely financed by contributions from the PAs, constructed principally by the PAs with some training, technical assistance and short-term equipment assistance provided by the Government. To qualify for government assistance the PAs will have to agree to construct the road to RR10 standard (so that erosion and other undesirable side effects are minimized); must agree to provide finance and/or construction inputs; must accept responsibility for ordinary maintenance of the road; and must be responsible for keeping the road closed during the rainy season.

The Government would provide personnel to survey the line for the road, training to help PA leaders to organize work gangs, advisory personnel to help get construction started properly and to return for spot check monitoring during construction, heavy equipment for special tasks such as rock cutting or blasting for which hand labor is unsuitable, and, in some cases, handtools.

2) Relief and Rehabilitation Rural Roads

In drought-prone areas of Ethiopia where access for drought relief supplies and personnel remains a problem, roads (normally of RR10 standard) are eligible for inclusion in the 5-year Program based on

emergency access criteria. In many, if not most, cases roads constructed for emergency access reasons, will also contribute to agricultural and other development in the affected areas. Drought roads which have already been, or are currently being, built in Wello, Tigre, Hararghe, Bale, Sidamo and Gemu Gofa would come within the program for maintenance purposes.

3) EPID Rural Roads

Roads to be constructed for the EPID-managed Minimum Package Program, Phase II, will be part of the rural roads program. The relative priority of these roads will be determined principally by EPID and will form an integral and vital part of the overall MPP II program now in the final stages of design. AID, together with IDA and SIDA will be providing assistance to MPP II. All donors and the Government are aware of the need for close coordination between the planners in EPID and those in the Road Authority who will be responsible for the detailed planning and implementation of the national Rural Roads Program. Demands to be placed upon the roads implementation capability of the Government by MPP II road requirements have been accommodated in the 5-year rural roads program.

4) Roads Identified in the Crown Agents' Study

The Crown Agents prepared a list of roads in descending order of priority for each Administrative Region (Province) and by awraja (county) with each Region based upon written presentations by the Provincial Rural Roads Committees. Some of the roads on these lists are also EPID or RRC roads, many, however, are not and were selected by the Crown Agents on the basis of socioeconomic criteria and the contribution which each proposed road would make in each of 76 development and social service factors grouped in ten categories (Development--agriculture, livestock, minerals and energy, forestry, tourism, general; Social Services--medical, education, general; Quality of rural life). Within each Administrative Region, the awrajas were ranked by priority according to the following variables:

Actual crop production
Actual cash production
Livestock
Agriculture extension services
Forests
Population
Schooling
Health services
Regional integration
Accessibility

In some cases the measurement was positive (e.g., head of livestock per household) and in some cases negative (number of school age children not going to school/total school age children). All variables were given an equal weight of 1 except regional integration which was assigned a weight of 2.

In general, as stated in the Crown Agents' Report

> ". . .the effect of the ranking system can be summed up as follows. An awraja received a higher priority ranking the higher its:
>
> i) density of settlement
>
> ii) deficiency of government, social and agriculture services
>
> iii) area of afforested land
>
> iv) length of all-weather road or distance between awraja capital and Provincial capital, and density of all-weather road network." *

When all was put together, the Crown Agents prepared a Provincial Report for each of the 14 Administrative Regions which presented a ranking of roads taking into account the awraja priorities and the priority list of roads within each awarja. Top priority was given to roads connecting virtually inaccessible awraja capitals to the capital of the Administrative Regions. The next highest priorities tended to be roads which connected specific development projects or areas and which had been given high priority by the Provincial Rural Roads Committees. These areas were normally one of three types: (a) areas of outstanding development potential, (b) areas where firm development plans existed, or (c) areas where development plans were underway.

The roads finally selected for inclusion in the 5-Year Program by the RRTF largely followed the recommendations and methodology of the Crown Agents.

c. The Rural Roads Organization

Beginning with the Rural Roads Working Group in 1972 and continuing as a theme in the efforts of the Rural Roads Task Force and the Crown Agents is the argument that the construction and maintenance of rural roads must

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* Provisional Military Government of Socialist Ethiopia, Ethiopian Roads Authority, "Rural Roads Study, Report" Vol. 1, p. 34, 1976.

be the responsibility of an organization whose sole responsibility is for roads of the RR10, 30 and 50 standard discussed earlier. There was at first considerable argument over whether this organization should be under the umbrella of ERA or completely autonomous from it. This has become a moot issue, however, with the establishment in 1975 of the Rural Roads Division of ERA to work on the drought roads. The argument is no longer whether the Rural Roads Organization (RRO), which is now in the process of being established, will be separate from ERA or not; but how it will relate to the other divisions and organizations within ERA.

The RRTF has submitted its recommendation to the Council of Ministers that a Rural Roads Organization be established as a semi-autonomous unit within ERA. (See Chart I following page.)

The RRO would commence life, by necessity, as a relatively centralized organization for planning and management but would move to decentralize responsibility for rural roads to Provincial Rural Roads Organizations as soon as staff could be adequately trained and provincial offices established. Initially, nearly all responsibility for rural road construction will be retained centrally. Over the course of the 5-year program a considerable portion of this responsibility will devolve to the Provincial Offices which will be established according to a time-phased schedule. Certain provinces such as Wello and Gemu Gofa would gain responsibility sooner than other provinces because of the already existing nucleus of on-going drought road activities in the former.

The central office will have essentially two divisions: administrative and technical. In addition there will be a small staff to coordinate the activities of the provincial rural roads offices. The Administrative Division will deal with personnel, finance and supply. The Technical Division will have sections dealing with evaluation, research, self-help roads, survey and design, inventory and equipment services.

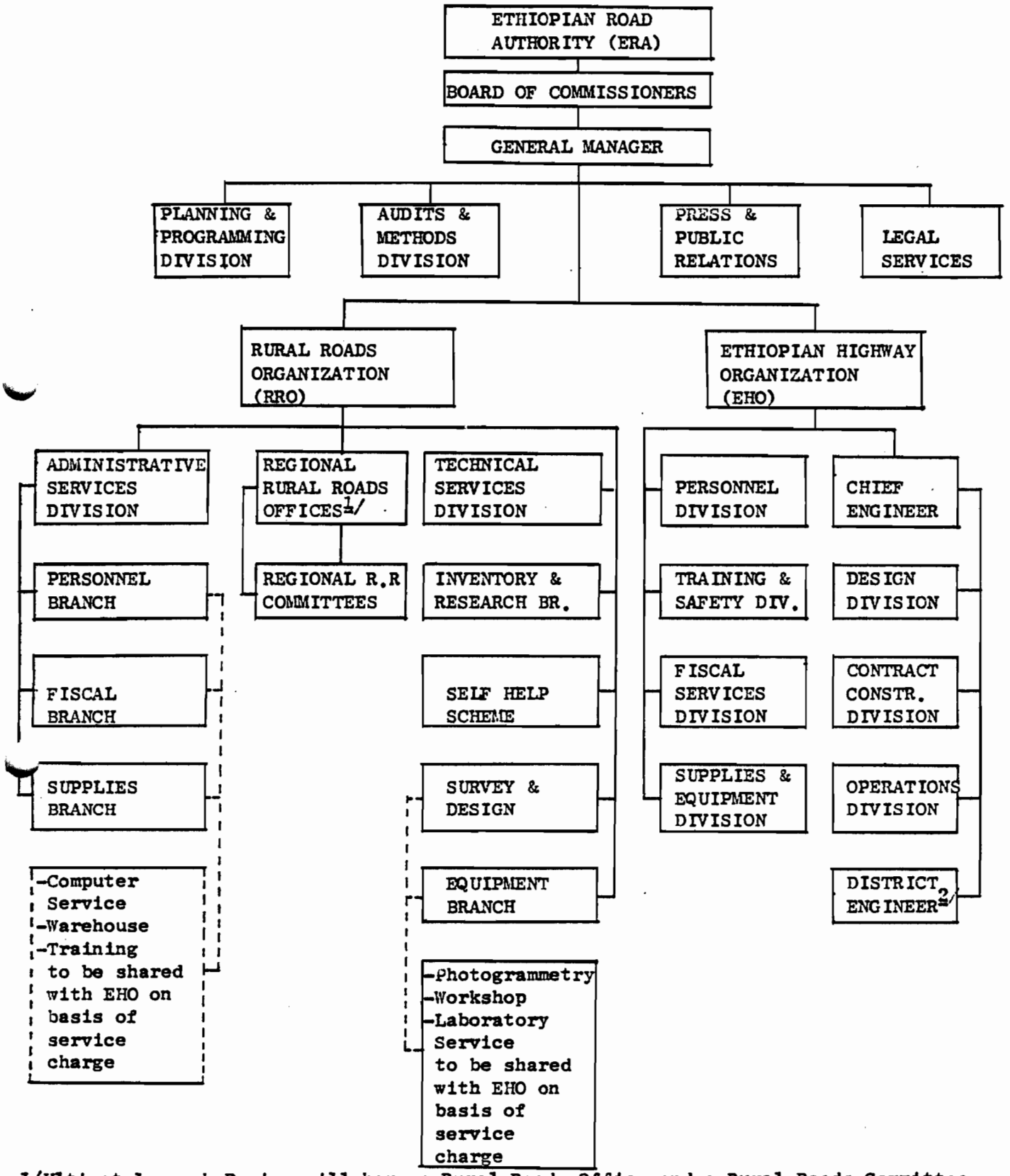
1) Provincial Rural Roads Office (PRRO)

The province-level organization as it becomes fully functional in a given province will consist of a PRRO, a Provincial Rural Roads Committee (PRRC) and construction, maintenance and, perhaps, "augmentation" units to carry out the actual work.

The PRRO will be established in each provincial capital. (See Annex B for chart showing PRRO composition.) It will be headed by a Provincial Rural Roads Engineer (PRRE) responsible for all rural roads activities in his province. He will receive advisory assistance from the PRRC composed of representatives from provincial and awraja Revolutionary Development Committees, Peasant Associations, development ministries, the ERA District Manager, with himself, the PRRE, as secretary. The PRRC will assist the Rural Roads Organization in drawing up the

CHART I

ORGANIZATION OF ETHIOPIAN ROAD AUTHORITY AND RURAL ROADS ORGANIZATION



1/Ultimately each Region will have a Rural Roads Office and a Rural Roads Committee. These entities will be transferred from the RRO to the Regional Administrations as soon as possible.

2/There are nine districts, each headed by an engineer and containing administration, direct labor construction, maintenance, warehousing, signs and workshops

provincial rural roads priorities, in helping solve labor problems and will serve as a bridge for a smooth transfer of the administration of rural roads construction and maintenance activities from the center to the regional offices.

2) Regional Construction Units

One or more rural roads Regional Construction Units (called "Provincial Construction Units throughout the rest of this paper) will be established in each Administrative Region headed by construction supervisors who will be responsible to the PRRE. The 5-Year Program calls for the establishment of 23 construction units in the 14 Administrative Regions to execute the program within the program period. Each construction unit, which may (as has been recommended by the Berger consultants) be divided at times into 2 light-construction units, will have the capability of constructing an average of 90 kms of RR10 roads per year and correspondingly lesser amounts of RR30 and RR50 roads. The recommended equipment and personnel for the Construction Units is discussed in more detail in the technical analysis section (Annex B), but in general each combines moderate amounts of road building equipment with about 150-190 skilled and semi-skilled personnel and about 400-500 unskilled laborers.

The Construction Units fall into neither entirely capital-intensive nor entirely labor-intensive categories. They represent a pragmatic attempt to maximize the use of labor in road building tasks where pick and shovel and wheelbarrow work makes sense (drainage, shaping, some hauling of less than 100m) and to use equipment where comparative cost/benefit analysis shows equipment to be substantially more productive per cost unit.

3) Regional Maintenance Units

In each province one or more Regional Maintenance Units will be established, each with the capability of maintaining approximately 300 km of rural roads per year. Maintenance, more than construction, can be characterized as labor intensive with routine maintenance undertaken by work gangs recruited locally. Each Maintenance Unit would require about 200 unskilled laborers. Some heavier maintenance such as regravelling of RR50 roads will require some pieces of relatively light equipment in addition to the work gangs. The importance of road maintenance has been stressed by the Crown Agents and the Rural Roads Task Force which has stated that no road would be built under the construction element of the program without assurance that the road would be maintained.

4) Regional Augmentation Units

The "Augmentation Unit" concept has been proposed by the Berger Consultants as a variation on the regional Construction and Maintenance Unit concept. The Berger Team has proposed that some pieces of the

more expensive heavy equipment and related personnel which the 5-Year Program includes in construction and, to a lesser extent, in Maintenance Units instead be placed in a mobile Provincial Augmentation Unit which would provide services to construction and maintenance activities. When the Construction Unit required heavy equipment such as a rock crushing unit, such equipment would be supplied from the Augmentation Unit for the time required. In addition the Augmentation Unit would include equipment to be dispatched to self-help road projects for short periods of time. The basic advantages of the Augmentation Unit are to reduce the number of large, expensive pieces of equipment needed in a province, and the more efficient use of the pieces on hand.

5) Manpower and Training (See Annex D)

a) Manpower

The 5-Year Program classifies personnel required in three categories: professional, skilled and unskilled. The professionals are university graduates with years of experience filling the roles of engineers, economists, geologists, etc. The skilled personnel are generally trained in technical, vocational and commercial schools. They fill the jobs of superintendents, foremen, mechanics, electricians, welders, equipment operators, engineering aides, clerks, typists and accountants. The unskilled laborers, watchmen, etc., are to be recruited locally from Peasant Associations at each construction or maintenance site.

The central headquarters office of the RRO will begin life with a staff of 150-175 in the first year; building to a maximum of slightly less than 300 in the third year, and then reducing from that level thereafter as Provincial Headquarters are slowly brought up to full staff and take over the management and supervisory roles temporarily established at the center. Initially, about 15 central staffers will be in the professional category, less than fifteen will be in the unskilled category and the remaining 140 or so will be in the skilled categories.

Each of the Provincial Headquarters Offices, when fully staffed will have slightly in excess of 100 personnel headed by a Provincial Engineer and divided into 3 branches--administrative, equipment (repairs) and works. The 5-Year Program indicates that these offices are likely to be established relatively slowly because of the lack of sufficient trained personnel. In most of the 14 Administrative Regions, the Rural Roads Provincial Headquarters Offices will not be fully established during the 1978-82 period. The professional and skilled personnel required for these offices is more than the education system can turn out during the period. (There are numerous competing demands for these types of people, including secretarial and clerical, in other government development agencies.)

Each Construction Unit will be headed by a road Supervisor and staffed with about 150 skilled and 400-500 unskilled personnel. The Construction Units will be less difficult to staff than the Provincial Headquarters because the skills required are more available. For example, the Construction Units require numerous gang foremen and equipment operators, which are available from previous road-building or other construction operations or which can be trained in the relatively short period of 4-8 months. The Provincial Headquarters, on the other hand, will require a fairly large number of mechanics for first, second and third echelon equipment maintenance and repairs, surveyors, planners and one (or more) fully fledged engineers. These skills are much scarcer and the training period is of years duration rather than months.

Eventually, there will be more than one Regional Construction Unit in each province. In most cases, however, during the initial 5-Year Program period there will be only one Construction Unit per province.

Each Maintenance Unit will be composed of about 30 skilled personnel and 120-150 unskilled laborers. Recruitment of personnel for these units is not expected to be difficult and establishing a functioning maintenance capacity at the provincial level should prove to be the least difficult of the many tasks facing the RRO.

a) Training

During the 1978-82 period, ERA plans to train more than 1,200 personnel at its Alemgena Training Center which is located about 20 kms outside Addis Ababa. Of these, 800 will be undergoing training for rural roads and 400 for the main roads section of ERA. The training schedule for rural roads is as shown in Chart II on following page.

The increased training needs will require that the Training Center double its capacity so that at any given time it can handle up to 120 trainees as opposed to the current limit of 60. Under IDA financing the local instructional staff is being increased from 19 to 27. The physical facilities of the Center will be expanded to accommodate the increased numbers of students and additional training equipment and materials will be provided.

In addition, training plans call for the establishment of two Training Production Units (TPUs)--one for main roads and one for rural roads. The TPUs will cover the training and upgrading of various categories and levels of personnel under normal working conditions in the field while carrying out regular highway and rural roads operations.

In addition to training at Alemgena, and on-the-job training, there will be an additional requirement for practical overseas training for certain categories of skilled and professional personnel. For the engineers it

CHART II

ERA/RRO MAJOR TRAINING REQUIREMENTS, 1978-82*

RURAL ROADS

	1978	Man-Weeks Per Course	1979	Man-Weeks Per Course	1980	Man-Weeks Per Course	1981	Man-Weeks Per Course	1982	Man-Weeks Per Course	Total of Training	Total of Man-weeks
1. Equipment Operators												
(a) II Graders	20	12	16	12	18	12	16	12	10	12	80	240
(b) III Dozers	24	8	12	8	15	8	12	8	-	-	63	168
(c) II Loaders	9	8	6	8	5	8	4	8	-	-	24	72
(d) I Rollers	13	1	12	1	10	1	8	1	-	-	43	9
2. Stationary Equipment Operators												
(a) II Crushers	9	1	6	1	5	1	4	1	-	-	24	5
3. Engineering Aide II	25	12	23	12	23	12	18	12	2	12	91	96
4. Engineering Aide III	24	12	15	12	11	12	11	12	-	-	61	60
5. Construction Foreman I	8	12	12	12	10	12	8	12	-	-	38	36
6. Construction Foreman II	9	12	10	12	10	12	8	12	2	12	18	36
7. General Foreman	1	12	3	12	7	12	5	12	2	12	39	36
8. Quarry Foreman	6	8	6	8	5	8	4	8	-	-	21	24
Total	148	98	121	98	119	98	98	98	16	48	502	770

* This Requirements Plan is presently being revised but will still be roughly of this magnitude.

would consist of 6-12 months of on-the-job training in construction management. For supervisors and related skilled personnel it would normally be of about six months duration and would be in countries where rural road construction and maintenance programs are more advanced than in Ethiopia. Thailand and the Phillipines are possibilities but other countries will also be investigated.

d. Financial Requirements

1) General

In FY 1975 and 1976 total Ethiopian Government expenditures were about 20 percent of GDP. Of these total expenditures, about 13 percent or 140 million Ethiopian Birr (US$ 68 million) was devoted to roads in 1976. During the FY 1978-82 period the total annual expenditure for roads would increase to an average of 16 percent of total Government expenditures. This increase would largely be attributable to greatly increased expenditures for rural roads which would approximate 4 percent of annual Government expenditures during the period.

The total 5-year requirement for the entire roads program is $631 million of which the Ethiopian Government's share will be in the range of US$ 417-447 or 66-71 percent. (Over the period 1972-76 the Government financed about 67 percent of road expenditures, net of taxes and duties.)

External assistance currently envisioned is as follows:

TABLE I

External Funds	US$Million
Committed	96
Agreed in principle	38
Highly likely	50
Possible	30
	214

Organizations which have committed funds to on-going subprojects include IDA (Transport Sector Credit, Fifth and Sixth Highway projects), KFW (West Germany), Peoples Republic of China and AID. The African Development Bank and the European Development Fund have agreed in principle to finance new subprojects. Included in the "highly likely" category is this present AID grant and further assistance from AFDB, KFW and ODM. Other donors included in the "possible" category include SIDA (Sweden), CIDA (Canada), USSR and North Korea.*

*Note: these commitments, possibilities, etc., are for the national road effort as a whole; not as portions of the AID-financed rural roads project which is a subcomponent of the national program and is described separately below.

2) Rural Roads Financing

The ERA 5-Year Program proposes a total 5-Year expenditure of Birr 256.4 million (US$ 124.8 million) for rural roads. The IDA appraisal report, done jointly with ERA, modified the figures somewhat to come up with the following estimated financial requirements of Birr 213 million (US$ 103.6 million) for the total rural roads program:

TABLE 2

Estimated Expenditures - Rural Roads
(Birr millions in 1976 prices)

		1978			1979			1980			1981			1982		
	Capital	F	L	T*	F	L	T	F	L	T	F	L	T	F	L	T
1.	Ongoing projects	8	9	17	7	8	15	2	3	5	1	2	3	0	1	1
2.	New Projects	-	-	-	2	2	4	8	10	18	12	18	30	16	22	38
3.	Purchase and rehab of equip.															
	- construction	11	2	13	11	2	13	7	2	9	-	-	-	-	-	-
	- maintenance	1	-	1	1	-	1	1	-	1	1	-	1	1	-	1
4.	Building, workshops studies	1	1	2	1	1	2	1	1	2	2	1	3	2	1	3
	TOTAL CAPITAL	21	12	33	22	13	35	19	16	35	16	21	37	19	24	43
	Recurrent															
1.	Admin & Eng.	-	1	1	-	2	2	-	2	2	-	3	3	-	3	3
2.	Road Maint.	-	1	1	-	3	3	-	4	4	-	5	5	-	6	6
	TOTAL RECURRENT	-	2	2	-	5	5	-	6	6	-	8	8	-	9	9
	TOTAL CAPITAL & RECURRENT	21	14	35	22	18	40	19	22	41	16	29	45	19	33	52

NOTE: IDA convention excludes costs of equipment for Direct Labor projects (est. 20% of total projects costs). Any equipment purchased required for direct labor projects are shown under fixed assets.

In constant 1976 dollars the Government would finance about US$ 6 million in rural roads capital expenditures in FY 1978 (principally in ongoing rural roads projects which would be absorbed into the RRO) rising steadily,

* F = Foreign, L = Local, T = Total

as new projects got underway, to US$12 million in 1982. Government financed recurrent costs would increase from US$1 million in 1978 to US$4.5 million in 1982. Total Government financing for the Rural Roads Program will be approximately US$56.5 million (54.5 percent). Required donor financing will be US$47.1 million (45.5 percent).

Given recent Government revenue performance which has been better than projected because of the international coffee markets (a considerable portion of government revenues are derived from a tax on coffee exports), and the likelihood that the revenue situation will remain favorable during the 1978-82 project period, the Government should have sufficient financing for its share of the Rural Roads Program. All indications from the EPMG are that the program has, and will continue to have, a very high priority call on Government revenues.

e. Current Status

As of June, 1977, it is understood that the Council of Ministers has approved in principle the formation of the Rural Roads Organization as a semi-autonomous unit of ERA and a proclamation to this effect is expected as soon as legal and administrative details have been worked out. The IDA loan contains as a condition precedent to disbursement that the organization will commence activity not later than December, 1977.

The present Rural Roads Division of ERA will become the nucleus of the RRO and the drought roads projects and other road projects currently in progress under RRD auspices will be taken over by RRO. Equipment and personnel engaged in these projects will also be taken over by RRO. In addition, RRO will be given authority to utilize existing road equipment presently owned or managed by the various administrative regions. This equipment has been thoroughly surveyed by a Louis Berger equipment engineer working closely with ERA counterparts and a report detailing the required repair, spare parts and associated costs for rehabilitating these pieces of equipment with remaining useful lifetimes has been prepared for ERA.* RRO will agree to service and maintain this equipment and utilize it for projects in the administrative region which owns the equipment.

Present plans call for construction to proceed according to the following schedule:

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* "Inventory and Rehabilitation Report Non-ERA Highway Equipment", Louis Berger International, Inc., November 1976

TABLE 3

Rural Road Construction Program (km)

	1978	1979	1980	1981	1982	TOTAL
Ongoing RRC (drought)	427	404	217	161	19	1,228
New RRC (drought)	110	140	135	110	210	705
Sub-Total	537	544	352	271	229	1,933
Ongoing EPID (MPP)	214	124	30	-	-	368
New EPID (MPP II)	12	65	80	100	146	403
Sub-Total	226	189	110	100	146	771
Ongoing RR Study	65	-	-	-	-	65
New RR Study	-	486	863	1,113	1,117	3,579
Sub-Total	65	486	863	1,113	1,117	3,644
TOTAL	828	1,219	1,325	1,484	1,492	6,348

In addition to the above, a yet-to-be determined number of kms of self-help roads will be constructed to RR10 standard by Peasant Associations with technical and some capital assistance from the RRO.

Presently the Rural Roads Division is receiving assistance for constructing drought roads from AID, IDA and ODM, and assistance on EPID roads from IDA and SIDA. For the period 1978-82, ERA and the Planning Commission Office (PCO) has solicited expressions of interest from donors to assist in financing the 5-Year Rural Roads Program. To date only IDA has actually committed funds for the Program. IDA has agreed to assist in establishing regional Rural Roads Offices in Wellega, Illubabor and Kefa and is providing US$6.5 million for support to the Rural Roads efforts in these administrative regions. In addition, IDA is providing US$1 million to expand the training capability of ERA, the majority of the expanded training being for the Rural Roads Organization.

Other donors which have expressed an interest in assisting the rural roads effort include SIDA, CIDA, OMD, EDF and possibly the PRC and the Eastern European nations.

SIDA assistance, if available, would probably be linked largely to the EPID MPP II program with some emphasis on Arussi and Hararghe administrative regions. CIDA assistance, if it should become available, would probably be concentrated in the south (Bale, Sidamo) where they are already embarking upon a water development program. The security situation, however, presently

poses a problem in this area. ODM may be willing to continue previous assistance in Wello with some possibility for expansion into northern Shoa and parts of Tigre (again, security is a problem in some of these areas). There is no ODM commitment at this time, however. The EDF total assistance package for Ethiopia currently contains a line item for assistance in training for rural roads, but this has not yet been discussed in detail with the Government. There may also be some possibility for assistance in road construction and maintenance as the EDF aid package for Ethiopia takes firmer shape.

The PRC is currently assisting in the reconstruction of the road from Weldiya (Wello) to Wereta (Gondar) and may be willing to expand this effort into some form of participation in the national rural roads program. The USSR and the GDR have both recently indicated their desire to expand their economic assistance efforts in Ethiopia and this could include assistance to rural roads. Yugoslavia and Bulgaria are other possible sources for assistance.

2. The AID Project

a. Background

Since 1972, AID has indicated willingness in principle to participate in a national program of rural roads construction and maintenance. AID is no stranger to road construction activities in Ethiopia as the following table shows:

TABLE 4

AID Assistance for Road Projects in Ethiopia
(US$000)

Name of Activity	Duration (FY)	Amount of Assistance
Highway Econ. & Feasibility Study	1961-63	95
Highway Maintenance Project	1962-67	3,310
Third Highway Program	1964-68	4,000
Bailey Bridges Project	1964-71	889
Highway Equipment Repair Fac.	1970-75	4,425
Fifth Highway Program	1972-	9,300
Agriculture Sector Loan I *	1970-72	2,082
ASL II	1971-73	1,767
ASL III	1973-74	3,872
ASL IV	1974-76	7,492
Borana Range Development (Roads Component)	1965-73	200

* For Agriculture Sector Loans, only reimbursement to Ethiopian Government for road activities shown.

Ada District Development (Roads Component)	1972-76	282
PL 480 Title II Self-Help Roads	1968-73	300
Relief Assistance Roads	1975-	4,562
Drought Recovery and Rehabilitation (Roads)	1976-	3,125*
Total Assistance to Roads		45,606

In early 1976 ERA and the Planning Commission asked USAID/Ethiopia whether AID would be willing to consider assisting the rural road programs for the provinces of Gemu Gofa, Bale and Sidamo. The rationale was that AID was already heavily involved in drought road activities in these provinces and equipment management, repair and spare parts inventory would be simplified if AID-financed American source/origin equipment was concentrated in one geographic area. British-financed equipment would be concentrated in another, Swedish equipment in a third, etc. The USAID agreed in principle to this concept (although it represented a modification to the PRP which had previously been submitted to and approved by AID/W). The consulting firm of Louis Berger International, Inc. was engaged to prepare a project proposal and corollary recommendations to assist the USAID prepare a Project Paper. Delays in finalizing the Crown Agents' report and in signing the Work Order with Berger resulted in the consultants team not arriving in Ethiopia until February, 1977. Their report was not completed until May 20, 1977.

The worsening security situation in Bale and Sidamo prevented the team from undertaking necessary field investigations in these Administrative Regions, and after negotiations with the Government, it was decided to substitute Gojjam, and possibly Shoa, for Bale and Sidamo. Part of the Berger team, augmented by Mission staff, was able to do the necessary field review in Gojjam but time did not allow for field work in Shoa and it was determined that the construction and maintenance elements of the AID project would be confined to Gemu Gofa and Gojjam for the period 1978-1980.

b. Description of the AID-financed Project

The PP to this point has dealt with the Ethiopian Government's 5-Year Rural Roads Program of which the AID-financed project is only a part. From this point onward this chapter deals specifically with the AID-financed project. (The term "project" used in this chapter refers to the AID-financed component of the Ethiopian Government's Rural Roads "Program".)

* Additional $875,000 required in FY 1979.

1) Goal

AID proposes a 3-year project (1978-80) which will help the Ethiopian Government establish two Provincial Rural Roads Organizations (including construction, maintenance and self-help advisory capabilities) in Gemu Gofa and Gojjam administrative regions and assist the new Central Headquarters in carrying out this responsibility. While actual roads will be financed, the emphasis is very much on setting up the organization at the Provincial level to lay the groundwork for gradual but definitive decentralization of the management and decision-making of rural roads construction and maintenance to the provincial (administrative region) level. There will be a natural tendency to focus on the roads themselves rather than the administrative structure (and, indeed, much of this paper deals with the roads) but it is here stated categorically that the establishment of the Provincial Rural Roads Organizations during the three years of this project is a more important objective than the numbers of kms of roads constructed or maintained.

The total cost of the program is US$8.0 million in FY 1977 appropriated funds, provided under terms of a project grant agreement signed between the U.S. and Ethiopian Governments prior to September 30, 1977.

This project would constitute Phase I of a longer term American assistance program for rural roads development in Ethiopia which is likely to last for 10 years or more. The project provides for an in-depth evaluation in FY 1980 leading to the design of a Phase II project with initial funding in FY 1981.

a) Goal Statement

> To assist Ethiopia's rural poor gain access to markets for their agricultural production and to enable them to participate increasingly in the Ethiopian Government's rural development programs.

This goal statement is consistent with the DAP, the Interim Strategy Statement of October, 1976, AID policies regarding directing assistance to the rural poor, and with the Ethiopian Government's own development priorities. Making progress toward achieving the goal, if done in concert with other development activities such as MPP II and the Grain Storage and Marketing program, will help increase farmer income markedly. Progress toward the goal will also mean that rural health, education and other social programs can reach substantially more of the rural poor than they do at present.

Maximizing progress toward the goal will require a high degree of collaboration between the Rural Roads Organization, the Planning Commission Office, EPID, the Ministries of Education and Health and some of the more specialized organizations such as the Relief Commission, the Livestock and Meat Board, the Malaria Control Service and others. The coordination will be the responsibility of the Planning Commission Office.

2) Purpose

To help establish a functional capability within the Ethiopian Government to construct low-cost low standard rural roads; to make measured progress toward decentralization of rural roads construction and maintenance to provincial offices; to assist peasant associations to construct self-help roads.

The AID project is not aimed at getting particular roads built in particular places in a given time period. (Though roads built and maintained will be an output and measure of progress toward the goal.) Rather, it is aimed at assisting the Ethiopian Government to develop a decentralized administrative, technical and capital capability to construct between 1,000 and 1,500 kms of new rural roads per year over the long run and the capability for adequate periodic maintenance of these roads. In addition, AID wishes to help the Government develop a substantial capacity to be able to respond to requests for assistance from Peasant Associations in constructing self-help roads.

The process will require several years before fully staffed Provincial Offices are functioning. This is particularly true because the shortage of skilled manpower has been aggravated by interruptions in the school system during the last three years. Central Office allocation of scarce skills and emphasis on training and supervised local construction will mark the first 2-3 years of the project followed by greater decentralization of skilled staff and authority in the following 2-3 years. As a result, the project will commence with a relatively strong central office directly managing provincial construction and maintenance units in Gemu Gofa and Gojjam (and elsewhere) with a timetable for devolution of these responsibilities to the provincial offices over the 5 years of the Government's program. Because of the experience already gained in Gemu Gofa with the rural roads in the drought roads program, the delegation of responsibility to Gemu Gofa will proceed at a faster rate than that for Gojjam. It is anticipated that Gemu Gofa will be nearly fully staffed and functioning with a full delegation of authority by 1982. Gojjam will be about 60 percent staffed and not yet functioning with a full delegation of authority in 1982.

3) Outputs

Both provinces will be constructing and maintaining roads according to the schedule shown in the technical analysis section in Annex B. The construction and maintenance units (including the augmentation units) will be established pro forma using existing equipment and starting on labor intensive aspects of the construction and maintenance programs. They will grow to full capacity as the equipment arrives in Year Two of the project.

a) In Gemu Gofa, the unit constructing the Weito-Omo River road* will constitute a first Construction Unit. A Maintenance Unit will be assembled in 1978 and a second Construction Unit to work on the five roads listed below be fully assembled in late 1978. This second unit will be responsible for the approximately 336 kms of rural road construction included for funding in this project according to the following schedule:

Priority	Standard	Location	Lengths Kms
1	RR10	Arba Minch/Gidole Road - Felege Neway	167
2	RR10	Arba Minch/Sodo Road - Chencha	25
3	RR10	Arba Minch/Gidole Road - Sidamo Province Border	50
4	RR10	Turmi-Murle	60
5	RR10	Jinka-Mago Park Headquarters	34
			336

The above constitute the highest priority new road construction as determined by the Crown Agents' study. ERA's Rural Roads 5-Year Program, however, only listed the first and third roads for construction in the '78-'82 period. The likely delays in starting road activities in Bale, Sidamo and other administrative regions where the troubled security situation persists will free Government finance for an earlier start and an increased number of roads to be constructed in Gemu Gofa. AID will finance the FX costs of equipment and spare parts for the rehabilitation of existing equipment. In addition, AID will finance the purchase of hand tools for the unskilled workers and for Peasant Associations. The Government will finance local road construction costs and Ethiopian personnel costs.

The project will also help finance the maintenance of rural roads in Gemu Gofa starting with 55 kms of roads in the first year and building to 370 kms in the third year. (This will increase to 734 kms by year five.) AID will finance the costs of rehabilitating existing equipment and the FX costs of new equipment. The Government will finance all recurring maintenance costs.

* Being financed by AID under the Drought Recovery and Rehabilitation Project.

AID will also help finance the costs of construction of the Provincial Rural Roads Headquarters compound including an office, equipment workshop and warehouses. The Government has already begun construction of the headquarters using its own finances. AID will reimburse the Government for 66.6 percent of total construction costs for the Provincial Headquarters incurred after September 30, 1977.

The concept of the Light Construction Unit and the Augmentation Unit is discussed in detail in the Technical Analysis section in Annex B. It is not dealt with here except to note that the concepts have not yet been fully agreed to by the Government and will be subject to negotiation at the time of review of the Draft Project Grant Agreement. It is AID's view that the Augmentation Unit would be the most likely place to include the Self-Help roads technical assistance personnel. When a piece of equipment is required for a particularly difficult task in an otherwise labor-intensive self-help road effort, it would normally be despatched from the Augmentation Unit.

AID assistance for the self-help road component of the 5-Year Program would not be large because the total financial requirement of such a program is not large. As mentioned earlier AID would finance the local purchase of hand tools for projects in Gemu Gofa; and would also provide financial support for a training program at Alemgena directed at those who will be providing technical assistance for self-help roads; short term study tours for RRO personnel to observe self-help roads projects in other developing countries and local cost support for training sessions for peasant association leaders who would be responsible for the day-to-day management of the individual projects. By Year Three of the project the RRO will be able to assist in approximately 80-100 kms of self-help road construction per year in Gemu Gofa. In later years this figure would increase.

The process of selecting the self-help roads to receive assistance would be handled by the Provincial Rural Roads Committee working with the Provincial Revolutionary Development Committee. Peasant Associations or groups of associations would submit their requests to the PRRC through the PRDC. The PRRC would determine the priority ranking of the requests and, based upon information from the Provincial Rural Roads Engineer as to the approximate number of kilometers of self-help roads which the RRO could provide assistance for in a given year, would draw the line. The PAs would have to agree to construction to RR10 standard and to agree to keep the road maintained. (See Annex G for further discussion on the Self-Help Roads.)

b) In Gojjam there is currently only minimal activity in rural roads construction. In FY 1978 a Construction Unit would be established to commence operations early in FY 1979 on the following list of roads for construction in the first three years:

Priority	Standard	Location	Length Kms
1	RR10	Welet Abay-Dghi	17
2	RR10	Debre Markos-Erob Gebeya	40
3	RR10	Minese Kola-Berekt	25
4	RR10	Erob Gebeya-Mota	65
5	RR10	Bichena-Shebel	25
6	RR10	Bulched-Yejube	35
7	RR10	Fagita-Dangia/Fafa	25
8	RR10	Moto/Bichena Rd-Mertole Mariam	25
9	RR10	Chagni-Debate-Debre Zeiyt (Total length of road is 105 kms)	33
		Total Gojjam	290

These roads constitute 9 of the 11 top priority new rural roads listed by the Crown Agents. Seven of the nine are listed in the ERA's Rural Roads 5-Year Program.*

In addition, AID would help finance a Maintenance Unit which would start with a program maintaining 102 kms in the first year, rising to 307 kms in the third year (and 551 kms in Year Five).

The Provincial Rural Road Headquarters would commence life by sharing quarters with the existing Highway Equipment Repair Facility in Debre Markos, but AID would finance 66.6 percent of the costs for additional office space, warehouse and other facilities. AID will also finance the cost of establishing construction camps for the various road construction projects. Training and self-help road assistance are as for Gemu Gofa (see above).

It is important to note again that the AID project aims at establishing a long term capability to build and maintain roads in these two provinces. Whether or not every single kilometer of road is completed according to schedule is not critically important in this first phase. The important measures of output progress are those that indicate that the Provincial Rural Roads Organizations have been established, have begun to function reasonably well; that the flow of required professional and skilled personnel have arrived at approximately the pre-determined rate; that measurable progress toward decentralization of authority and responsibilities has been achieved; that procedures for assisting the self-help roads have been established and the processes by which Peasant Associations can request and receive assistance are functioning. For the term of this relatively short project these are more important than the actual numbers of kilometers of roads built and maintained; if they are achieved, the kilometers of roads constructed and maintained over the longer term will be steadily increased.

* Two others listed in the 5-Year Program were not included; one (Almahel-Bambudi) because of the proximity to the Sudan border; the other (Dangala-Aessebe) because it does not appear in the CA report and was not appraised by the Berger field team.

Of course in the short run, meeting or not meeting the output targets in terms of kms of roads constructed and maintained is also an important signal of how well the provincial organizations are doing their job. The output levels shown by year in the technical analysis section were selected as reasonable targets for these newly established organizations to achieve in each of the first three years of operation. Consistent under-achievement would indicate that the administrative linkages were not yet functioning properly and that remedial or corrective action was required.

It is because the institution-building dimension of the project is more important in this first phase than construction of a particular set of roads that it has been decided that fixed amount reimbursement (FAR) procedures are inappropriate and will not be employed. FAR would put too much of the financial burden on the new RRO and problems likely to be inherent in its growing pains would tend to hold up payment or reimbursement from AID.

4) Inputs

a) AID-financed

i) Technical Expertise

1. Construction/Maintenance Engineer (3 years)
2. Equipment Specialist (3 years)
3. Procurement and Supply Specialists - short term
4. (with return visits)
4. Organization and Methods expert (6 months)
5. Trainer on rural road C/M (2 years)
6. Trainer for rural roads superintendents (6 months)
7. Trainer on Technical report writing (6 months)
8. Trainer on project cost accounting (6 months)

Total cost technical expertise $953,000

ii) Equipment and Machinery

The project will provide 170 pieces of construction and maintenance equipment, communications equipment, survey and workshop tools and equipment for Gemu Gofa and Gojjam. The cost of this equipment if purchased in FY 1978 including inflation and contingency factors is estimated to be $4.45 million. Repair parts (including replacement tires) will be financed at a cost of $1.41 million. In addition hand tools will be procured locally for the construction and maintenance units and for Peasant Association self-help roads at a total cost of $212,000.

iii) Provincial Headquarters

AID will help finance the cost of construction of the provincial headquarters compounds, office space and shops in Gemu Gofa and Gojjam according to the specification shown in the technical analysis section. Of the total estimated cost of $300,000, AID will finance up to 66.6 percent or $225,000, whichever is lesser.

iv) Construction Camps

AID will help finance the cost of establishing construction camps required for the rural road construction effort in Gemu Gofa and Gojjam. It is estimated that nineteen such camps will be required in the two provinces during the 1978-80 period. The average cost of establishing each camp is estimated at $36,000. The total cost to AID will be $457,500.

v) Training

The Government and IDA will be financing most of the costs associated with the expanded training program. AID will finance the costs of 18 short term (3 month) study tours of RRO personnel in other developing countries to study a variety of rural road construction and maintenance programs. AID will also finance the costs of nine 6-month on-the-job training programs in rural road construction and maintenance management for Ethiopian road engineers and supervisors which have already had 4-6 years of job experience in Ethiopia. Finally, AID will finance the training costs associated with the self-help program including training at Alemgena for supervisors and other personnel and on-site training for Peasant Association leaders.

b) Ethiopian Government Financed

i) Central Headquarters building. The Government will soon begin construction on a modest office facility on the present ERA compound in Addis Ababa to house the central RRO staff.

ii) Provincial Headquarters. The Government will finance all costs of construction of the Provincial Headquarters in Gemu Gofa and Gojjam prior to signing the Project Grant Agreement and all costs for these structures not financed by AID.

iii) Personnel and related non-personnel costs. The Government will finance all these costs for Ethiopian personnel in the Central Headquarters (a prorated share of 14 percent being costed against this project) and in the PRRO, Provincial Construction and Maintenance Units.

iv) P.O.L. The Government will provide all required POL for the project vehicles and equipment.

v) Materials and supplies. The Government will provide all necessary materials and supplies for actual road construction. These include cement, culverts, reinforcing steel, explosives and related items purchased locally.

c) Summary of Input Financing (estimates)
(US$000)

Input	AID	EPMG	TOTAL
1. Construction of facilities	683	182	865
2. Personnel		5,715	5,715
3. Non-Personnel		709	709
4. Equipment	4,451		4,451
5. POL		1,277	1,277
6. Spares	1,405		1,405
7. Handtools	213		213
8. Materials & Supplies		247	247
9. Technical Expertise	953		953
10. Training	288		288
	7,993	8,130	16,123

III. PROJECT ANALYSES

A. Technical Analysis

The Technical Analysis is found at Annex B and is not included here because of its considerable length. The Initial Environment Examination (IEE) which discusses the environmental aspects of the project is included at Annex C.

The Technical Analysis concludes that the technology of this project is appropriate within the context of Ethiopia at this time and presents considerable data to show that the project is reasonably priced and designed.

The IEE, submitted to AID/W in April, 1977, shows that the adverse environmental impact of the project is minimal and that given the requirement to provide access to rural Ethiopia at a reasonable cost, that no alternative methodology would provide the needed roads at anywhere near the cost of these roads. The RR10 standard itself is designed to minimize adverse environmental effects by providing minimal drainage, following the contour of the landscape whenever possible and heavily emphasizing the need for recurrent maintenance. The fact that self-help roads* are required to be constructed to RR10 standards as a conscious effort to counteract the adverse environmental efforts of prior self-help roads, dramatically demonstrates the commitment of the RRO and of the Provincial Administrations to the need for actions to protect and preserve the environment to the greatest possible extent.

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* In the past a considerable threat to the environment because they consisted of little more than indiscriminant clearing of vegetation and often resulted in increased erosion.

B. Financial Analysis and Plan

1. Total Costs

The total cost of the 5-Year Rural Roads Program is estimated by IDA to be $103.6* million (in 1976 prices) of which the Ethiopian Government will finance US$56.5 million (54.5%) and donors will finance US$47.1 million (45.5%). See Table 2 in Chapter II.

The total costs of the 3-Year AID-financed project in Gemu Gofa and Gojjam with related AID technical and training assistance to the central headquarters and the Alemgena Training Center is $16,123,000, of which the AID-financed portion is $7,993,000 (49%) and the Ethiopian Government financed portion is $8,129,000 (51%). (See Detailed Project Cost Table 5 on next page.)

2. EPMG Financing

The prospects for the Ethiopian Government meeting its financial commitment to the project are very good. In the period 1971-74 the problem on the capital expenditure side was one of ERA's being unable to expend its capital budget allocations because of lack of capacity rather than a lack of budget commitment. Since 1974 ERA implementation capacity has improved and expenditures increased from US$19 million in 1974 to US$100 million in 1976. (Half of these capital expenditures in the period 1971-76 were financed by foreign loans and grants.)

On the recurrent side ERA's expenditures have grown steadily and have almost completely utilized budget allocations which have been viewed as entirely adequate. (The World Bank has noted that an earlier problem of irregular seasonal flow of funds impeding maintenance has now been overcome.)

While there is no overall Development Plan currently in effect, the 5-Year Highways and Rural Roads Plans have been approved by the Council of Ministers. In addition the budget request for the First Year commencing July 8, 1977 of the Rural Roads Program has been approved as requested and Ethiopian Government funding of rural roads activities for this period has been authorized by the Ministry of Finance.

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* The Government's 5-Year Rural Roads Program totals $125 million, but the IDA computation, done in conjunction with ERA shows a lesser figure due in part to differing costing conventions employed by IDA.

TABLE 5

3-YEAR PROJECT COSTS
(US$000)

Description of Input	Gemu Gofa	Gojjam	Central Office*	Total Project	AID FX	AID LC	EPMG FX	EPMG LC
1. Facilities								
a. Offices	167,857	167,857	71,428	407,142		224,925		182,217
b. Construction Camps	237,900	219,600		457,500		457,500		
2. Personnel								
a. Salary	2,274,142	2,179,762	275,005	4,728,909				4,728,909
b. Per Diem	424,285	424,285	22,680	871,250				871,250
c. Food	62,301	52,254		114,555				114,555
3. Non-Personnel	341,122	326,965	41,250	709,337				709,337
4. Equipment	2,225,354	2,225,354		4,450,708	4,450,708			
5. P.O.L.	673,907	602,740		1,276,647			1,276,647	
6. Tires	365,378	325,536		690,914	690,914			
7. Repair Parts	383,506	330,291		713,797	713,797			
8. Hand Tools	106,352	106,352		212,704		212,704		
9. Materials & Supplies	130,062	116,449		246,511				246,511
Sub-Total	7,392,166	7,077,445	410,363	14,879,974				
Technical Assistance				952,706	952,706			
Training				287,500	287,500			
Total				16,120,180	7,096,625	895,129	1,276,647	6,852,779

AID Total = 7,991,754 (49%)
EPMG Total = 8,129,426 (51%)

* Central Office Costs pro rated at 14 percent of total Central Office costs.

TABLE 6

Actual and Proposed Roads Expenditures - Rural Roads*
(US Millions)

	Actual 1973-77 in 1976 Prices**	Proposed 1978-82 in 1976 Prices	Proposed 1978-82 in Current Prices***
Capital			
Road Construction/ Improvement	8	63	99
Buildings & Equipment	5	25	32
Training, Tech. Asst. & Consulting Services	2	5	7
Sub-Total	15	93	138
Recurrent			
Administration and Engineering	1	5	8
Road Maintenance	0	9	14
Sub-Total	1	14	22
TOTAL	16	107 ****	160

* Source IDA Report No. 14166-ET p. 20. Includes physical contingencies on all capital items.

** 1977 Figures are budget estimates.

*** Includes price contingencies on the following basis: Equipment 8% in 1976, 7.5% per year in 1977, 78 and 79 and 7% per year thereafter; foreign component of civil works 10% in 1976, 9% per year in 1977-79 and 8% per year thereafter; all local expenditures 15% in 1976, 12½% in 1977, 10% in 1978-79 and 8% thereafter.

**** Corresponds roughly to IDA figure of $103.6 million shown elsewhere in this paper. Discrepancy is minor and may reflect nothing more than slightly different costing approaches employed by IDA in its appraisal.

Rural Roads expenditures will require about 4% of the total government budget during the 5-Year Program period. Given the Ethiopian Government's objective of increasing the geographic spread of development and social service programs, the level is deemed appropriate (constituting approximately 1/4 of all road expenditures during this period). Given the high priority which the Government has assigned to Rural Development and the critical importance of these roads to the spread of development there clearly exists considerable assurance that the Government will indeed meet its capital and recurrent budgetary requirements for the project.

3. Detailed Financial Cost Estimates

The detailed cost-estimates for the AID-financed project are contained in Annexes B and F. These costs are judged realistic and reasonable.

4. Financial Management Capability of RRO

The capability of the RRO to budget and account properly has not been determined. However, the capability in the regard of the parent organization, the ERA, has been demonstrated to be very high over the course of numerous AID and World Bank projects. The RRO will be allocated some personnel for budgeting and accounting and additional personnel will be recruited from the commercial schools and/or trained for these tasks at Alemgena. AID will provide a trainer in project cost accounting.

5. Financial Aspects of Self-Help Roads

With regard to financing the self-help road component, the RRO has an annual proposed budget of US$500,000 for providing technical and limited capital assistance.* The actual construction costs including labor, supplies and materials (but excluding handtools and explosives) will be contributed by the local Peasant Associations.

6. Use of Fixed Amount Reimbursement (FAR)

The local costs components for AID financing are three: (1) reimbursement for Provincial Headquarters Office construction in Gemu Gofa and Gojjam up to $225,000; (2) reimbursement for building rural roads construction camps in the two provinces up to $450,000; and (3) reimbursement for the purchase of handtools for rural roads construction and maintenance units and self-help roads activities in the two provinces up to $213,000.

Since the upper limits are set, and will be so specified in the Grant Agreement and since the items funded are already set, these reimbursement procedures are actually simpler. If the actual costs are less than these amounts there would be a savings to the U.S. Government which would not accrue under FAR.

* $250,000 in Year 1 and $500,000 in Years 2-5.

7. Reasonableness of Cost Estimate

(Discussion on this issue is contained in the Technical Analysis, Annex B.)

TABLE 7

SUMMARY COST ESTIMATES AND FINANCIAL PLAN*

(US$000)

Project Element	AID FX	AID LC	EPMG FX	EPMG LC	TOTAL
1. Construction of Facilities					
a. Offices	-	225	-	182	407
b. Constr. Camps	-	458	-	-	458
2. Personnel					
a. Salary	-	-	-	4,729	4,729
b. Per Diem	-	-	-	871	871
c. Food	-	-	-	115	115
3. Non-Personnel	-	-	-	709	709
4. Equipment	4,451	-	-	-	4,451
5. P.O.L.	-	-	1,277	-	1,277
6. Repair parts	714	-	-	-	714
7. Tires	691	-	-	-	691
8. Hand tools	-	213	-	-	213
9. Materials & Supplies	-	-	-	247	247
10. Technical Assistance	953	-	-	-	953
11. Training	288	-	-	-	288
TOTAL	7,097	896	1,277	6,853	16,123

TOTAL AID FINANCING

	FX	LC	Total
Grant	7,097	896	7,993

* Inflation factor and contingency already included in equipment costs. See Annex B.

TABLE 8

COSTING OF PROJECT OUTPUTS/INPUTS ($000)

INPUTS	OUTPUTS					
AID Appropriated	1.	2.	3.	4.	5.	TOTAL
1. Construction of facilities	225	458	-	-	-	683
2. Equipment	401	2,226	1,246	356	223	4,451
3. Tires & Spares	90	758	405	77	75	1,405
4. Handtools	-	50	56	50	57	213
5. Technical Expertise	166	529	204	27	27	953
6. Training	40	188	60	-	-	288
Ethiopian Government						
1. Construction of facilities	111	50	21	-	-	182
2. Personnel & Non-Personnel Costs	1,615	3,710	927	100	72	6,424
3. P.O.L.	84	608	394	96	95	1,277
4. Materials & Supplies	-	151	61	25	10	247
TOTAL	3,732	8,728	3,374	731	559	16,123

Outputs

1. Decentralization to Provincial headquarters.
   Indicators: a. Number of skilled staff assigned. b. Headquarters constructed.

2. Rural Roads Constructed or rehabilitated.
   Indicator: Actual kilometers constructed or rehabilitated/planned figure.

3. Rural Roads Maintained.
   Indicator: Actual kilometers maintained/planned figure.

4. Self-help Roads Constructed.
   Indicator: Actual kilometers constructed/PRRC request.

5. Self-Help Roads Maintained.
   Indicator: Actual kilometers maintained as percentage of kilometers constructed.

C. Social Analysis

1. Introduction

The social analysis deals specifically with the peoples of Gemu Gofa and Gojjam Administrative Regions--those affected by the rural roads program components being funded by AID. For a broader perspective of the likely affects of development generally on the Ethiopian rural poor reference should be made to Allan Hoben's "Social Soundness Analysis of Agrarian Reform in Ethiopia" (revised, December 1976) specially prepared for USAID/Ethiopia.

The social analysis of this or any project in present-day Ethiopia is made more than normally difficult by the overriding factor of the ongoing Ethiopian Revolution. The depth and magnitude of changes overtaking traditional Ethiopian society should not be underestimated and as a pervasive, dynamic and on-going force it is rapidly taking Ethiopia--including rural Ethiopia--into directions that largely cannot be charted. The clear implication of this is that the social analysis should be read and employed for whatever purpose with more than normal caution. The situation is considerably more fluid and complex than any such analysis can portray. In this situation, attempting to usefully measure the impact of a single development program--even one as seemingly important as rural roads--on social mores, habits and attitudes of large groups of peoples otherwise being subjected to the winds of rapid change is an exercise verging on the impossible.

Roads, in and of themselves, may be considered a necessary but not sufficient condition for rural development; at least in most of Ethiopia. It would be unrealistic to treat the effects of a rural roads program on change in the absence of (or in isolation from) the many other change factors operating in the rural environment. These include the effects of other Government development and social programs which the expansion of the road network helps spread further to previous inaccessible rural groups. Yet, even the impact on the inhabitants of Gemu Gofa and Gojjam of the total package of Government development packages can only very imperfectly be perceived given the magnitude of the effects of the ongoing revolution.

2. Intended Beneficiaries

a. General

This portion of the social soundness analysis examines the issue of who will benefit from rural roads once they are constructed. It is

also necessary to examine how they will benefit from low-standard roads and what additional development inputs are required, if any, to produce these benefits.

The intended beneficiaries of the rural roads are the rural agriculturalists, pastoralists, craftsmen and cottage-industry producers in Gemu Gofa and Gojjam Administrative Regions.

Together with their dependents, this group includes at least 85 percent of the population in these regions, or about 2.5 million rural dwellers. It is possible to estimate how many of these intended beneficiaries will actually be provided with improved access to vehicle transportation by the rural and self-help roads to be built with the assistance of the projects.

However it implies assumptions concerning an area of influence, the kilometrage of road constructed per annum and the need of the population to use these facilities.

The group which will be affected by the rural road projects already given high priority include some of the poorest and most disadvantaged rural populace in Ethiopia.

In addition to the direct and intended beneficiaries, small traders and merchants will benefit from improved access to rural produce and urban markets. Despite the emphasis of the EPMG on peasant service cooperatives and state participation in the distribution and marketing of agricultural produce and basic consumer goods, the private sector still occupies an important segment of the overall market but its role may diminish as the present time is considered a transition period to Socialism.

The new basic units of local self-government, the Peasant Association, will benefit from rural roads by having easier and thus increased participation in higher level peasant associations and the growing institutions of regional awraja and woreda self-government and coordination of central government programs. The access of associations, through their elected officials, to these higher levels of decision making and resource allocation will strengthen their legitimacy and services to association members.

Despite some questions which are raised herein about the absolute participation basis of peasant associations, for most of the areas dealt with, they represent a much broader participatory base than traditional systems. This is particularly true with regard to inclusion of previously low status groups. The role of women in the new associations is unclear, but provides some immediate improvement of their political participation with possible long range constraints.

How will rural dwellers benefit from improved transportation? In the long run this must occur through increasing rural production--agricultural, livestock products, and crafts or cottage industry products--and the returns which rural dwellers received from their production.

Those peasant agriculturalists who already produce cash crops or marketable surpluses of basically subsistence crops, may receive some increased profit per unit sold if transport is improved. More importantly, rural producers should have more incentive to produce cash crops and surplus if they can be easily marketed. Peasant Associations are established in most of the areas in which the project will exist. Although functioning with quite different degrees of effectiveness and representing varied leadership groups within local communities, associations are under pressure and receive assistance to set up service cooperatives. These cooperatives can engage in the establishment of rural cooperative stores--for agricultural inputs and consumer goods, and in the marketing of produce. Similar cooperatives can and are being established by craft and cottage industry groups to purchase raw materials and market their production. These cooperatives will significantly benefit their rural members and can, if they have a large enough membership to contribute capital, except to contract for bulk transport of goods.

Rural dwellers will, assuming a minimum of public transport on the new roads, enjoy far easier access to urban and town based services, particularly health services. Obtaining improved health services is one of the most frequent reasons stated by rural dwellers for wanting roads.

b. Constraints and Disbenefits

There are no known cultural groups in the potential areas of road construction who oppose the construction of roads per se. There are groups who may oppose roads as a channel for increased government presence in local areas, although these are likely to be few. One of the major causes of this fear is the past pattern of increased alienation of land in newly accessed areas. Assuming that the RRO works effectively with local administration and peasant associations and the new land reform, these problems should be minimized.

The only categories of rural dwellers likely to be immediately harmed by roads are those currently engaged in the transport of goods by animals. In many of the areas in Gemu Gofa and Gojjam those engaged in this form of transport are not from the rural areas they serve. Considering the continued dependence on animal transport in areas

with roads, and the scope these transporters have for extending the range of their travels based on the new roads, even these groups should not be seriously harmed for the foreseeable future.

A serious long range disbenefit of roads may accrue to local rural artisans and handicraft producers from the increased influx of cheaper manufactured substitutes for their output. This process is already occurring in many of the areas in the two regions, and the rural roads program will only accelerate it. The only solution to the problem in the long run is strong governmental support of handicrafts and rural technology appropriate to new demands likely to be generated by mechanization. This would involve the transformation of village blacksmith operations to producing simple agricultural implements. Thus far, some areas of hand production such as weaving of certain types of cloth have held up well throughout Ethiopia, apparently because of cultural preference for traditional items.

The Government's new Handicrafts and Small Industry Development Agency is focussed on just such development. Its funds were recently doubled and it is gradually moving from the planning to the implementation stage of promoting more rural crafts and agriculturally related industries.

Rapidly evolving government policies on state control and intervention in most aspects of the economy may create at least short-term motivation problems in relation to peasant production. Few of the groups in the regions presently appear to have a strong sense of collective motivation and reward. It seems clear that the EPMG plans to shift rewards and motivations to more political and social bases, deemphasizing individual material rewards for production. There may be problems in getting subsistence, family production unit-oriented peasants to accept this new system--at least in the short run. This could seriously impair the production increases and transformations which will be required to significantly accrue benefits from rural roads.

3. Gemu Gofa

a. Socio-Cultural System

Gemu Gofa's population of about one million lives in one of the most varied socio-cultural landscapes found in Ethiopia. The rugged topography of much of the region, reinforced by culturally perceived boundaries, has contributed to the persistence of about 40 separate cultural groups in the region. Some 27 identified languages are spoken by these groups, representing three major linguistic families found in Ethiopia--Omotic, Lacustrine and Sudanic.

Within the socio-cultural complexity, three broad socio-environmental complexes will be dealt with in this analysis. The northern part of Gemu Gofa was, until recently, almost exclusively inhabited by Omotic speaking, highland agriculturalists. Taken as an internally diverse, but related group, this is the largest cultural complex in the region. Almost all of the groups in this area belong to what has been described as the "ensete culture", centered around the strongly sedentary symbolism of this intensively cultivated, slow maturing (about nine years) staple crop.

Recent settling in the lowlands of the north, in the Rift Valley in the east and other valleys in the west, has largely been by agricultural peoples from outside the region. These lowland areas generally offer relatively abundant but not malarial land. The few large commercial farms begun in the region before the revolution were in the eastern lowlands. In both spontaneous and government settlements in these areas, individual holdings frequently average five hectares and above. Where water is available for irrigation, these areas offer considerable agricultural potential. Even without irrigation, the single reliable rainy season offers at least one good crop a year.

The southern highland-lowland complex contains groups in which the traditional distinction between high and low altitude groups pertains but operates less rigidly than in the north. This complex includes exclusively highland groups (the Konso), lowland groups (Tsamai, Geleb, Mursi and Bodi), southwestern groups spanning the two highland zones (the Bako-Gazer, Shagame and Ubamer) and groups which exploit both highland and lowland zones (the Hamer). These groups combine various mixtures of agriculture and pastoralism, many of them in adaptive systems responsive to both ecological and political pressures.

Relationships of trade and somewhat unstable patterns of alliance and conflict exist among many of the southern groups from the Konso in the east to the Geleb in the west. The core of the northern highland groups, the Gemu Gofa and Basketo groups, appear to have little traditional interaction with lowland groups. Despite their strong cultural and linguistic similarities, they appear to have limited interaction across the north-south lowland valleys that divide the major highland complexes of small distinct societies. No major trade routes exist in the region.

Despite recent improvements in access within the region, Felege Neway in the west is generally reached from Arba Minch by going north to Wolayta Soddo and then southwest to Felege Neway. Jinka in the southwest is now reached by going due south to Konso then west below the major highlands. Little long-range movement or trade occurs across the highlands.

The low level of interaction among northern highland groups living on different major plateau areas has been supported by both topographic and Amhara administrative policies. It is likely that the sense of cultural revitalization in the highlands will lead to increased contacts between essentially similar groups with generally compatible interests. The hierarchy of peasant associations at woreda and awraja levels should provide an acceptable basis for strengthening this new sense of wider class and cultural identity. The peasant association structure, based on administrative units which separate the eastern and western highland areas, will not provide a ready venue for increased contact between these groups. Several of the proposed roads will provide increased access between these areas but the structures and motivations for any significant increase in contact are uncertain.

It appears unlikely that the rural roads, which will provide greater access from the highlands to the lowland administrative and trade centers, will greatly alter relations between the traditional highland societies and the recently settled, culturally heterogenous lowland groups in the north. Supralocal peasant association units cross the highland-lowland division in many areas and should provide a constructive basis for increased mutual cooperation. The main danger of conflict in these heightened zonal contacts may arise out of differing basic needs and goals of growing urban populations, highly organized state farms and lowland production collectives, and the small farmer on highlands. Administrators, and presumably the Politburo cadres, are aware of these potential urban-rural class conflicts and appeared to be consciously attempting to defuse potential conflicts and work toward better mutual understanding between and among these groups. Roads will both accelerate these problems by increasing contact between highland rural and lowland urban groups while providing rural highland groups with the means to organize their marketing of agricultural production. At the same time increased contact will provide a basis for greater constructive cooperation between highland and lowland groups, making it feasible to work together on common problems and obstacles.

The network of intergroup relations based on trade, politics and mutual dependence and sharing among the groups of the southern complex is likely to be strongly affected by the new system of major drought relief roads already being built in the area. Together with the enlarged arena for intergroup contact and cooperation the establishment of peasant associations will provide, these major east-west roads will have far more impact than the spatially limited rural roads proposed for the area. The latter are essentially access roads providing vehicular access to the main road network from the traditional territories of specific groups such as the Geleb and the Mursi-Bodi or link roads between sections of the main network (Key Afer-Turmi).

These rural roads should improve the ability of the government to provide social services and development assistance to the groups to be accessed without qualitatively altering the changes already underway. The positive effects of these changes will depend heavily on the success of the southern Gemu Gofa Rehabilitation Project in balancing developments among groups in the area in such a way that traditional causes of intergroup conflict are reduced or eliminated.

b. Peasant Associations

The declared intention of the EPMG to establish peasant associations as the basic unit of local government throughout the rural areas of Ethiopia has been implemented with varying success in Gemu Gofa. The current extremes run from socio-cultural groups who have been virtually unaffected because of their isolation and simple economies, such as the Mursi-Bodi, to groups of mixed cultural backgrounds on former commercial farms who have formed producers' cooperatives and effectively collectivized their agricultural resources and efforts. Since these latter groups exist only in the east of the region, and are unlikely to be directly affected by rural roads given their current access to roads, they need not be considered in detail in this analysis.

Official statistics on the registration of peasant associations imply that associations have been formed in most of Gemu Gofa with the exception of southern areas of Geleb and Hamer Bako and Gardulla awrajas. These figures indicate a total of 687 associations in Gemu Gofa with a total membership of 270,354. The membership figures in this registration are internally inconsistent particularly for women. The associations registered probably include some which exist only on paper.

Within the northern highlands, there were a few areas in which strong initial resistance was present to the establishment of associations and the accompanying abolition of landlords, tenancy and hired labor. Kemba Woreda in Gemu Awraja was, and evidently still is, an area where associations are weakly established and continue to face opposition.

In other areas of the northern highlands, the establishment of associations and the implementation of the land nationalization and tenure reform proclamations has proceeded fairly effectively. It is not known how widely traditional social leaders were removed from positions of authority or excluded from positions in associations. The former balabats were generally excluded from the new associations and their lands, if over ten hectares, were taken over by the new associations. At least in Chencha and Otschollo, the relatively democratic assemblies and assembly leaders were abolished. There are no reports in the Gemu highlands of attacks on the authority or position of respected cultural and ritual leaders by the zemetcha.

The establishment of peasant associations and the implementation of land reform will continue to have effects on all aspects of life and organization of socio-cultural groups in Gemu Gofa which will far exceed the impact of rural roads. To the extent that peasant associations have been able to absorb the participatory traditions of many of the societies in the region, they have also supplanted these by broadening the base of participation. This has been most significant in the efforts by Zemetcha students and now Politburo cadres to include former low-status artisan groups within the membership of associations.

Peasant associations represent a strong base for local decision making, combining the broad based control of local resources with participation in the decision making processes of these resources. Despite their own remaining inequities in the use of land resources, the associations appear to represent a more equitable participatory structure than any of the systems they have replaced. The replacement of traditional structures has, however, also substituted new and culturally uncertain bases of legitimacy for those underlying previous local leadership structures. In addition to their control over the allocation of land, which most peasant associations have not been willing or able to exercise to the extent of carrying out equitable redistribution, local perceptions of legitimacy and efficacy will be improved by the associations' generation and allocation of new resources. Roads represent one way in which the ability of associations to create, deliver and allocate resources in accordance with their goals can be enhanced. Both the value and the need for the instrumentality of peasant associations have been increased by the heightening of expectations which has occured during the three years since the beginning of the revolution.

c. Participation of Women

Women as a group have generally been excluded from participation in peasant association decision making unless they are heads of farming households. Together with heads of farming households who are infirm or too old to actually farm, female heads of households are allowed to hire labor to work their land to which they have user rights.

In almost all of the cultural groups in Gemu Gofa, women also work the land and contribute substantially to agricultural production. In groups where the men tend to be seasonably engaged in pastoral activities, women carry out the majority of agricultural work. Among the Dorze, although apparently not in Konso, women contribute to weaving performed by men. Among most groups in the region women are responsible for marketing a large share of the limited produce sold in local markets.

Women Politburo cadres have only recently begun to operate in the region and it is perhaps too soon to judge the political effectiveness of women's associations. It seems clear, however, that a relatively gradual approach is being taken to improving the status of women in Gemu Gofa. In most of Gemu Gofa it appears that the productive contribution of women merit more direct political participation than is now allowed them.

d. Administrative Reform

The establishment and consolidation of peasant associations had radically altered the sources and distribution of authority in the rural local government. These developments have not, however, led to disappearance of the hierarchy of local administrators in local areas under the jurisdiction of the Ministry of Interior. In Gemu Gofa, as throughout Ethiopia, the last three years have seen great changes in the qualifications sought for administrators and in their approach to their responsibilities. These changes have not altogether undermined the fundamental role of the administrator as the chief representative of the central government's "line ministries" on the local level. The administrator still controls the local police, has administrative (not "technical") control over the operations of other ministries within his jurisdiction, and is generally responsible for the welfare and security of his jurdisdictions.

Administrators are no longer in a position to single-handedly bring about or prevent development in their jurisdictions, but their effectiveness and active support is still important to the types of development which must occur if rural roads are to truly benefit the local people.

The newly instituted Revolutionary Development Committees (RDCs) appear to formalize the coalition of administrators, POMOA (Provisional Office of Mass Organization Affairs) and representatives of mass organizations at the woreda and awraja levels. Although the goals of these bodies stress the defense of the revolution, they also have responsibilities for promoting development, and have powers of imprisonment to deal, among other offenses, with elements who hinder rural productivity.

Administrators and the RDCs can continue to play an important role in facilitating the supply of central government services and resources needed for local development. The RDC is in a particularly critical position to promote the local coordination and balancing of development efforts and external inputs.

e. Social Services

1) Health

An expansion of the services of the Ministry of Public Health in recent years in Gemu Gofa has not begun to meet the needs of the region for

health services. Most of what is offered by the MPH is limited to curative treatment. The MPH is responsible for efforts in preventative services and environmental sanitation, but has lacked the funds or personnel to have any real impact. With the exception of some local statistics compiled by Mission clinics, the only available figures on health conditions come from the Central Statistical Office. For 1974 Gemu Gofa had the highest crude death rate in the country at 23/1000 population; the highest infant mortality rate at 202/1000; and the second highest child mortality rate at 305/1000.*

The most frequently mentioned reason for wanting a road in disucssions with officials and representatives of peasant associations was access to better health care. In Gemu Gofa, at present, there is no hospital in the western half of the region and many of the lower level facilities lack staff, supplies, and in the west, accessible medical support. Cut off by road for up to eight months, the air service to Jinka and Felege Neway is a sometime affair, with planes currently not servicing these areas for several weeks or more at a time.

Ministry of Health officials are frank to admit that the provision of good health care facilities is currently bound almost entirely to roads. Although their manpower problems have been assisted by the decree that all graduates of medical training institutions in Ethiopia must work for the MPH, it is still difficult to keep good staff and provide logistic and professional support where there are no roads.

The strong orientation of the Ministry of Public Health towards the establishment of a basic health care system utilizing more para-professionals, will be greatly benefited by the provision of access roads. Such a system requires that support and supervision can be provided to local level workers. While it is feasible, with adequate motivation, to provide this support in areas requiring several days walking to reach posts, it is considerably more effective and cost effective in terms of utilizing manpower to provide support in areas accessible by road.

2) Education

Until quite recently Gemu Gofa, along with many other regions, had only one senior secondary school. When the capital of the region was moved from Chencha to Arba Minch in 1963, the senior secondary school was moved as well. As with many of the other amenities and services of the essentially Amhara towns, the senior secondary school moved with the administrators.

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* National averages for these same indices in 1974 were:
Crude death rate: 15/1000. Infant mortality rate: 155/1000.
Child mortality rate: 247/1000.

Peasant Associations have built some schools in the region, both with and without the assistance of Zemetcha students. Associations have also contributed labor and materials to the RPA built schools. Recent proclamations have given local communities a role in the administration of schools as well as their construction by establishing community committees to work with the government heads of schools. The main obstacle to the proliferation of at least minimal self-help schools has been the lack of qualified teachers. This again is an area where school administrators stressed the value of roads in helping to keep good teachers in relatively remote posts.

f. Summary - Gemu Gofa

The net effect of the rural roads program in Gemu Gofa is likely to be substantial in accelerating trends already underway. The new political organizations based around the peasant associations are already in place and will continue to spread with or without the roads. The road program will however affect the rate of expansion of these political changes particularly the links between lower and higher levels of representation. Socially and culturally, Gemu Gofa is already experiencing profound changes. Yet the area has not been static or changeless for at least the last eighty years--since the expansionist policies of Menelick first brought the area under Amhara hegemony. The 1974 revolution which, if anything, is gaining momentum, is introducing new social relationships and new roles to the rural population.

The Government is preparing, and in some cases is already embarked upon new development programs which will affect Gemu Gofa. These include the agriculture Minimum Package Program, improved grain storage and marketing, adult education, and an expanded rural health delivery system. The roads program will obviously facilitate the expansion of these activities to more people.

In addition, given the susceptibility of the province to recurrent drought, improved access will enable the Government to respond to future food and medical relief needs more quickly than in the past. (During the 1974 drought, food had to be airdropped in the more remote areas of north-central Gemu Gofa.)

4. Gojjam

a. General

The area of Gojjam to be affected by the RRO during the life of this project is inhabited by a single cultural group--Amharinya speaking, Ethiopian Christian, plow agriculturalists. Within the population of approximately 1,200,000, included in this group there are obviously variations but they are relatively minor variations on a strongly established theme.

The socio-cultural system in Gojjam is typically described in relation to three central, interrelated complexes. Highland plow agriculture, the traditional military-political hierarchy of lords and nobles, and the Ethiopian Christian Church. These properly refer to a period and a system of powers and rewards which is now passed. In a sense, Gojjam appears to be a system overdue for change, operating at least on the local rural level in terms of institutional structures which no longer represent the forces they once were. The rural socio-cultural system is involved in an on-going and reluctant process of adapting to changes within these three institutions and to the intrusion of new institutions of contemporary relevance.

Rights over a local unit of land, part or all of a parish, were traditionally possessed by local rulers on the temporary grant of a higher ruler or lord. These grants, which at least in theory originated with the Emperor, included judicial, tributory and corvee labor rights over the granted unit. Grants of local units were made by higher ranker's grantees who in turn owed their rights to still higher lords. In both symbolic and real senses, a hierarchy in which pragmatic subordination and tribute flowed up existed from the members of a family through the male head reaching up ultimately to the Emperor.

What has perhaps sustained this system based on rigid hierarchical and individualized relationships is that each of its components--household, land rights, political position and church hierarchy--is based, at least theoretically, on open recruitment. Although in practice some hereditary successions to positions occurred, all freemen could, and at times did, move both up and down in the system. Some advancements occurred by chance or recognition of bravery or daring. More often an ambitious and talented man could work within all these systems to increase his wealth, power and control over other men.

b. Role of Women in Gojjam

Women play no roles of authority in any of the complexes discussed. Within the household women are almost entirely excluded from agricultural production activities and expected to devote their lives to largely domestic duties. Women have traditionally managed garden plots, cultivated them and been involved in trading or selling some of the garden produce in local markets. Even in this role, however, women's independence has been a source of concern and suspicion to Amhara men.

Use-rights to land can be claimed through female ancesters, but women cannot themselves activate claims or apparently retain use-rights without the intervention of males. In this sense, women are carriers of land rights, not activators.

In religious activities, women are devoted worshippers and followers of the church but play no major roles in formally celebrating the masses and other rituals in parish churches. Women also have no positions in the hierarchy of the church in Ethiopia.

So far as is known, Amhara women played no formal roles in the traditional political system and could not aspire to any part in decision making.

As summarized by one observer of Amhara culture, "The Amhara peasant woman's lot is as hard as that of a slave. In the wealthier families, where domestic drudgery is relieved by servants, she must still be a passive, reserved nonentity."*

c. Peasant Associations

The Proclamation establishing peasant associations and implementing land reform came at a time when many of the northern regions were already uneasy about the new government in Addis Ababa. Although the land reform measures in the Proclamation of April, 1975 were modified for rist (communal) tenure areas, the volatile situation in Gojjam quickly developed into a number of armed uprisings, most notably in the areas around Motta. The Zemetcha students in Gojjam apparently remained close to the major towns and did not stray too far from roads. The results of their efforts to establish peasant associations were meager, even on paper. By September, 1975 the Ministry of Land Reform and Administration claimed 138, 4 and 1 associations for Debre Markos, Kola Dega Damot and Motta Awrajas.

Figures from the Ministry of Agriculture and Settlement in April, 1977 are somewhat more optimistic but are probably greatly inflated. They show 2,454 associations with a total membership of 378,113.

The problems encountered in forming peasant associations which represent some break from the previous structure of authority and leadership are understandable. The government has not attempted to implement land reform in the area. The reforms which the 1975 Proclamation did make are significant but largely unpopular--and probably still unenforceable.

These reforms would primarily benefit the landless and, implicitly, the low-status artisan groups comprising an estimated 5 percent of the highland population in Gojjam. There are no accurate figures on the number of landless tenants, but earlier surveys indicated a figure of about 13 percent for the entire region. Even some of these tenants may have

* Donald Levine, Wax and Gold, p. 78

been able to activate claims to land under the rist system, an action which the land reform proclamation made impossible. Given these estimates of those who have the most to gain from the reforms, and the creation of strong peasant associations, the amount of support for a change of local leadership is questionable.

In the face of the resistance already encountered and the unenthusiastic response to the reforms proposed, the government and the cadres are apparently proceeding cautiously in their motivational efforts. The main thrust of the government's efforts appears to be directed at the consolidation of the urban dwellers associations in the towns of the region. It is likely that most of the cadres in the region are operating in these towns. This is a traditional venue for changes in Gojjam, beginning in the central government created towns, but is quite the reverse of the progress of the revolution in the south of Ethiopia.

d. Participation

The communal land tenure system and relatively equitable distribution of holdings in Gojjam have been widely cited as basic reasons for opposition to some of the new changes and for the passive reaction to peasant associations. Peasant associations are based on a concept of broad-based participation and shared perception of mutual interests which is historically alien to traditional Amharic culture.

In relation to the construction and local development of benefits from rural roads, this situation implies that it is likely that leaders, not groups, will make decisions. These decisions need not be inequitable in their effect, though there is little internal impetus for the equitable distribution of benefits from the projects.

The distribution of land holdings, however, is relatively equitable and it has been created and sustained by the same type of system. This provides strong evidence that the local hierarchical pattern of authority may end up producing reasonably equitable benefits within rubric of peasant associations. This will not, however, be accomplished in the manner in which associations are intended to operate, at least not in the foreseeable future.

e. Administrative Reform

After the revolution and the resistance to the land reform, the new government has even further upgraded the qualifications of the administrators appointed to the woreda level. In addition to their education and experience, administrators posted to Gojjam are expected to have an understanding of the goals of the revolution combined with enough patience to deal with its slow progress in Gojjam.

Conversations with regional and awraja administrators and ministry officials at these levels uniformly portrayed a situation in which administrators below the woreda level (which still exist in Gojjam), were traditional leaders who perceived the administrative ranks above them in traditional terms. Both administrators and other officials expressed the view that little was likely to happen in rural areas, peasant associations notwithstanding, unless local leaders were told to do things.

This situation was demonstrated by visiting a "self-help" road project which was described by an administrator as being undertaken because of the desire of the local peasant associations for the road. The head of the project, when visited, turned out to be the sub-woreda chief of the area who appeared and acted as a traditional leader, governing from a combination of power, respect and personal accomplishments. When asked why the project was being done, the sub-woreda chief said that it was because he had been told to do it by the administrator above him.

As exemplified in the road project described above, this situation does present problems for a development project which requires the active participation of the rural peasants. Thus gaining the participation of the rural peasants in the construction of roads must be approached through the higher levels of the administration in the idiom of post-revolutionary participatory structures. Once at the local level, however, participation will be mobilized according to traditional patterns and utilizing traditional motivations. The quality of this participation cannot be judged prima facie, but it is not likely to represent the consensually determined, voluntary participation hoped for. The situation is likely to present even more problems with regard to the distribution of the potential benefits of road access. It seems apparent that these will be distributed according to traditional networks and priorities, which may or may not be reasonably equitable.

f. Social Services

1) Education

Indicative of the level of impact which the Zemetcha had in Gojjam, regional education officials were not aware of any schools which were built during the campaign. They admitted that it was possible but they simply did not know about them. Education officials in one awraja were not optimistic about the prospects for self-help schools being constructed by peasant associations. They claimed that since the education tax had been abolished, communities were no longer willing to work on schools in their areas. At the same time they said the student enrollment in the awraja was increasing more rapidly than before. Of the total of 33 schools they reported in the awraja,

only 3 of these could not be reached by vehicles at least part of the year. Roads not only made their support and supervision of the schools easier, but generally made it easier to keep good teachers in the schools. The new schools to be built in the area by the Rural Projects Agency (RPA) were likely to be all in the areas which were at least seasonally accessible by roads.

Urban areas in Gojjam do not present the cultural distinctions from surrounding rural populations found in Gemu Gofa. They still represent concentrations of social services and amenities, supported by the officials and civil servants in the towns and by the ties which rural elites maintain with the sources of power and commercial activity found in towns. Rural roads aim not immediately to disperse this concentration of schools in an area such as Gojjam. Since towns are not fundamentally alien in cultural terms to rural dwellers, they have less reluctance and in fact some preference to send their children whom they wish to go to schools to urban areas. Thus many civil servants posted in Gojjam appeared to prefer to leave their children in school in Addis Ababa rather than move them to schools in Gojjam, which they viewed as relatively less advantageous institutions. The same pattern is repeated within the region.

Thus despite the stress on the importance of roads for the provision of adequate educational facilities by officials, their own complaints about the willingness of local people to contribute to support schools raises doubts as to the local support for official views on demands for more rural schools.

2. Public Health

Somewhat in contrast with government educational facilities, the rural population of Gojjam appears willing and ready to assist in the provision of health care facilities. During the Zemetcha in Gojjam, eight clinics were built by students with the assistance of some local peasants. Since then an additional two clinics have been built by peasant associations in Metekel awraja and subsequently staffed by the Ministry. Nine new clinics are to be built this year by the RPA, primarily in rural areas. At the present time the Ministry is attempting to stress that clinics be built in less accessible areas and maintain a minimum distance between clinics of 25 kilometers. One of the problems with the Zemetcha-built clinics is that they were concentrated in areas along roads, in some cases too close together for the resources available to the Ministry.

Although the Ministry officials in the region acknowledged that too many of their facilities were concentrated along roads, they also claimed that almost fifty percent of their clinics could only be reached by walking and had to be supplied by mules. Since each facility was allowed a fixed budget, regardless of its patient load or service area, the added cost of transporting supplies by pack animal and providing administration to remote clinics reduced their capabilities to provide service. Health officials also indicated that it was more difficult to sustain qualified staff in remote locations and much more difficult to provide them with support and supervision. Staffing problems in the region and the nation generally, had been eased by the requirements last year that all health workers trained in government institutions had to work for the government.

g. Summary - Gojjam

The social and cultural system in which the rural roads program will operate in Gojjam is considerably different from Gemu Gofa. Here the traditions are more homogeneous and more firmly entrenched. Resistance to some of the central precepts of the Ethiopian Revolution is greater. The arguments in favor of the rural roads program are largely in terms of increased agriculture production and marketing. Gojjam is an important part of the Ethiopian "breadbasket" and eventually must produce more for export to the perennial food-deficit parts of the country. Roads will assist in increased production and marketing. There are, however, problems which the Government will have to be aware of. The motivation for increasing production will not be great if increased family income has no outlet through a more diversified consumer product market than now exists. The self-help road component of the project may be more difficult to implement in the context of retained traditional hierarchical decision-making, no matter how this latter process is disguised with the trappings of revolutionary change.

D. Economic Analysis

1. General

An adequate rural road net is essential for Ethiopia's rural farmers to gain access to more profitable production opportunities and to health, education and related services as well. Roads are needed not only for the transport of inputs into an area and production out but also to facilitate the flow of information and innovation into the rural areas.

The roads to be built by this project are minimal standard roads being built to the lowest possible costs within the limits of terrain and time. They are basically dry-weather roads, following the contour of the land. The emphasis during project design has been to hold costs to the minimum necessary to achieve the purpose of the project which focuses on developing a long-term capacity to build roads rather than upon the roads themselves.

The nature of a project such as this does not allow for benefit/cost (including rates of return) analysis normally employed for development projects. As the AID "Appraisal Guidelines for Development" points out:

> " Benefits (and costs) of transport projects proposed mainly to support a geographically isolated economic development cannot be segregated from the benefits (and costs) of the entire development. The benefits attributed, for example, to an agricultural penetration (or development) road cannot be meaningfully allocated or assigned to the road costs required for the project."**

While benefits normally result from rural road projects, it is extremely difficult to know what precentage or magnitude of total benefits are appropriately attributable to road construction/maintenance costs and what percent to attribute to other development projects operating in the same geographic area or to economic, social, political factors unrelated to the roads or other development projects.

As John Westley (AID/PPC) points out in another AID paper:*

> "It is also generally accepted that the benefits to transport investment related to agricultural development are often best measured not in terms of road user savings, but in terms of additional output resulting from a whole range of

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* Westley, John "A.I.D. Agriculture Development Policy", (Draft) PPC/PDA/SPA January 12, 1977 pp. 16-17.

** AID Appraisal Guidelines for Development, 1971. Part II.a. p. 26.

measures, one of which is road development. . . ./This/ latter approach /however/ does not provide a non-arbitrary means of attributing road benefits to road costs (or assessing the relative contribution to increased production of a particular quality of physical access). Since this leaves the appropriate level of road costs and standards indeterminate within a certain range, this approach requires greater emphasis on selecting the most cost-effective among the technical alternatives to meeting minimum levels of access. In designing programs involving development of networks of local roads (as contrasted with construction of relatively long penetration roads), another approach is to determine an appropriate budget level on the basis of local preferences. This could be done using a ranking index incorporating access to social services and distribution of benefits in addition to production considerations, with local organizations determining rankings, providing resources on some matching basis, and organizing labor-intensive construction and maintenance activity."

As can be ascertained from this PP, it is very much this latter procedure which has been selected as the most appropriate in the Ethiopian context.

2. Costs

Looking at the rural roads construction and maintenance components of the project, the construction cost of the 626 kms of RR10 roads is estimated to be $13,120/km, a total of $8,212,000, or roughly half of total project costs.

TABLE 9
UNDISCOUNTED FINANCIAL COST FOR CONSTRUCTION OF 626 km OF RR10 ROADS IN GEMU GOFA AND GOJJAM OVER 3 YEARS

	(US$000)
Equipment*	864
Provincial, Central Offices**	86
Materials and Supplies***	66
Road Construction Camps	404
Spares, repair parts, tires	818
POL	838
Handtools	50
Technical Assistance Applied to Construction	400
Training Applied to Construction	119
Personnel	4,567
	8,212

$$8{,}212 = \frac{\$8{,}212{,}000}{626\ \text{KM}} = \$13{,}120/\text{km}$$

* Value of depreciation assuming 7 year life-time. 1st yr. depreciation = Zero (because road output accomplished with existing rehabilitated equipment with cost only for spares for rehabilitation).
** Depreciable lifetime est. 20 yrs.
*** Depreciable lifetime est. 10 yrs.

When costs are discounted at 10 percent (a conservative discount factor) over the three year project life time the present value of construction costs drops to $11,120/km for a total of $6,960,000.

TABLE 10
DISCOUNTED PRESENT VALUE OF COSTS FOR CONSTRUCTION OF 626 km OF RR10 ROADS IN GEMU GOFA AND GOJJAM OVER 3 YEARS*
(US$000)

Equipment**	740		
Provincial & Central Offices	75		
Road Construction Camps	336		
Materials and Supplies	60		
Spares, Repair parts, tires	775		
POL	760		
Handtools	38		
Personnel	3,703		
Technical Assistance	358		
Training	105		
	6,960 =	$\frac{\$6,960,000}{626 \text{ km}}$	= $11,120/km

When discounted maintenance costs for the 10 year estimated average lifetime of the roads are added the total 10 years discounted costs of the 626 km of road are $11,020,000 or $17,600/km.

TABLE 11
DISCOUNTED PRESENT VALUE OF COSTS FOR MAINTENANCE OF 626 km OF RR10 ROADS IN GEMU GOFA AND GOJJAM OVER 10 YEARS***
(US$000)

Equipment	371		
Provincial & Central Offices	9		
Personnel	2,016		
POL	485		
Spares, Tires & Repair Parts	548		
Handtools	53		
Materials & Supplies	348		
Technical Assistance	173		
Training	57		
P.V. =	4,060 =	$\frac{\$4,060,000}{626 \text{ Km}}$	= $6,486/km

* D.F.=10%. Unskilled labor shadow-priced at .5.
** Purchase in Year One. Depreciable lifetime = 7 years. Depreciation commences in Year 2 for Years 2 and 3 only. (Year 1 construction is with existing equipment rehabilitated with spares, repair parts indluced above, with considerable labor employed.
*** D.F. = 10%. Unskilled labor shadow-priced at .5.

While this may seem a high figure for those used to very low cost rural roads in the realm of $7,000 - $10,000/km, one should keep in mind the only slightly more than 25% of the total length of these roads is in flat terrain. The remainder is in hilly or mountainous country (where the majority of the rural population lives).

In addition to the 14 roads specifically identified in this project an additional 150-200 kms of self-help roads will be constructed, funded in part by this project (including both limited AID and EPMG funding) but also including a sizeable amount of contributed labor by the Peasant Associations. It is estimated that 360,000 person-days of labor will be required to construct 200 kms of these self-help roads. With labor shadow priced at .5 of the daily unskilled minimum wage (Birr 2/day) and assuming the utilization of RRO equipment and personnel will be at the levels identified in the Financial Analysis section the construction cost of 200 kms of such roads would be in the $3,000-$4,000/km range.

3. Benefits

The project will attack a principal bottleneck which has impeded development of Ethiopians for decades (and continues to do so)--the severe and geographically pervasive lack of access and lack of transport. This, in turn, contributes to a remoteness of the nuclear peasant families from markets, from the means of increasing production (and income) and from social services.

The types of direct or primary benefits which will accrue from the rural roads activity in the two provinces will include those normally associated with road projects: increased vehicular traffic (in some cases from zero), reduced travel time for people and goods, reduced per unit transport costs, and reduced vehicle operating costs.

The indirect or secondary benefits which will accrue as a result of the project are in part the primary benefits to be derived from other development projects which will operate in the areas where the roads are built. These benefits will include increased production per hectare resulting from the expansion of the Minimum Package Program, Phase II (MPP II); increased per farm family income derived from increased production (and/or productivity) and increased net return to the farmer stemming from lower transport costs of fertilizer and other inputs and of the agriculture product which he sells. (This assumes that a portion of the lower transport costs are passed to the farmer rather than being entirely accrued by the transporters or passed to the consumer. Given the philosophy of the EPMG and its general pronouncements with regard to the rural poor farmer, this is considered a safe assumption.)

While benefits cannot be meaningfully apportioned to the roads aspect of all the development and social activities in the two affected provinces, an example of the magnitude of benefits which would be reguided to justify the expense of these roads may prove enlightening.

The Arba Minch/Sodo Road - Chencha Road will be 25 km long. It will service an area of about 500 km^2 which has a population density of 100 people/km^2 . Approximately 50,000 people or 10,000 farm families will utilize the road. The NPV of the 10-year cost of construction and maintenance will be $17,600 x 25 or $440,000*. The net incremental income which each family would have to derive from the roads being there in order to equal the discounted present value of the cost of the road is a 10 year income stream with a net present value of $44.00. If the road were responsible for an average income increase of only $10/year per family the NPV of this latter income stream per family would be $61.48** and the benefit cost ratio = 1.4. The application of fertilizer to 1 hectare of maize yields an increase of 14 quintals/ hectare on the average. The present Arba Minch price is $14.50/Qt. Assuming an average price of $12/Qt at constant 1976 dollars and pricing fertilizer to the farmer at EPID projected levels, the income derived from the application of fertilizer to 1 hectare of maize is $121/yr. The discounted income stream over 10 years is $743. Thus if less than 10% of the farm families served by the road were to derive net additional income equal to that derived from applying fertilizer to one hectare of land over the 10 year period, and if this net incremental income could legitimately be attributed to the road, the B/C from this one benefit alone would justify the road.

The total tonnage of required fertilizer at a recommended 1 Qt/**** hectare of DAP and ½ Qt/hectare of Urea is 1,500 tons/year. If the road enables the passage of fifteen 10-ton trucks per year carrying fertilizer, which were not able to get through previously, again, the road virtually pays for itself.**** To evacuate the increased production will require an average of three to four truck trips per week during the dry season.

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* All figures based on averages because of lack of specific data for the area.

** DF = 10%.

*** 1 quintal = 100 kg., 1 hectare = 2.5 acreas.

**** Transport costs of fertilizer were included in the costs to the farmer in calculating the farmers' net increased income.

It should be noted that the Minimum Package Program Phase II aims at doubling farmer family income in a program in which an estimated 60% of all Ethiopian farmers would be participating by 1990.* Thus, one can reasonably assume that the total benefit to the 10,000 farm families served by this road would be a considerable multiple of the benefit derived in this simple example shown here.

Secondary social benefits will also result or be enhanced as a result of the project. There are plans underway to expand the rural health delivery system and the non-formal (adult) education system at a much faster rate during the 1978-82 period (and beyond). In later phases of the program roads will be built through what are now malarial and tsetse infested valleys in Gemu Gofa (and elsewhere in the country) which will enable the Malaria Control Service and the Ministry of Agriculture's proposed Tsetse Eradication Program to make these presently uninhabited fertile areas safer for settlement. In addition, Gemu Gofa contains some of Ethiopia's last remaining wild game. One of the project roads connects the proposed Mago Park headquarters with the existing road system. This will not only help protect this dwindling resource but will greatly assist in the development of the tourist potential of the area and generate income for local Peasant Associations.

4. Economic Activity in Gemu Gofa and Gojjam

The above is illustrative of the types of economic activity which will be enhanced and extended by the rural roads construction and maintenance activity of the project. A summary of the present economic conditions in the two provinces is presented below.

a. Gemu Gofa

The estimated 1977 population of the Administrative Region is approximately 923,000.

Estimated Population Gemu Gofa (1977)

Awraja	(000)
Gamo	268.1
Gardulla	207.6
Geleb and Hamar Bako	164.4
Gofa	282.6
Total	922.7

* MPP II plans to expand contact from 15% of farmers in 1976 to 71% by 1980. Participation in the fertilizer and improved seed package program would be 60% by 1990 and 90% in the soil and water conservation program. The World Bank has estimated that B/C from the maize package program at 3.0, wheat 2.2, Teff 2.6, Barley 1.6 and Sorghum 3.2.

The population growth rate is estimated at 2.5%, the average for the country as a whole, but the rate may have been affected by the severe 1973-1975 drought and famine which hit Gemu Gofa hard.

Population densities vary greatly but the densest areas are the upper highland areas where 400 persons/km^2 occur. In the southern lowlands the figure drops to 10/km^2 and even less.

The province is highly rural with only one town exceeding 10,000 inhabitants.

Town	Awraja	Pop. (1970)
Arba Minch*	Gamo	6,670
Chencho	Gamo	3,690
Gidole	Gardulla	5,390
Felege Neway-Bolki	Gofa	5,000
Jinka-Bake	G&HB	11,690

Of these, the major towns in the province, only Arba Minch is accessible by all-weather road (although Gidole, and eventually Jinka, is being connected by the AID-financed drought road now being built).

The estimated per capita income of Gemu Gofa is considerably less than the national average of $100. The GDP of the province has been very roughly estimated at US$60-80 million with an annual growth of about 2.5%. Employment is broken down as follows:

Occupation of Population (10-59 years of age) 1974**

Agriculture	92.8
Administration	.2
Professionals	.3
Craftsmen	2.2
Traders	.7
Tej/Tella Makers/ Sellers***	1.8
Services	1.1
Other	.9
	100%

The vast majority of the people are engaged in agriculture (including livestock herding). The principal crops are: Maize (31% of total provincial agricultural output), Sorghum (22%), Teff (15%), Tree Crops (11%) and Barley (10%).

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* Provincial Capital.
** Central Statistics Office "Results of the National Sample Survey" Vol. 1 p. 35, January 1974.
*** Tej - honey mead. Tella - home made beer.

Yields for Major Crops 1975/76 (Quintals/Hectares)

	Teff	Barley	Wheat	Maize	Sorghum	Millet
S.W. Region (including Gemu Gofa)	8.3	4.3	4.9	17.3	10.7	16.1

(Source: Min of Agriculture Crop Production Survey 1975/76)

EPID has estimated that the total production of cereal crops from Gemu Gofa in a "normal year" is 81,000 MT or 2.5% of the estimated total Ethiopian production of 3,780,000 MT. The province is a food deficit area.

Of the total landholdings in the province an estimated 58% are .5 hectares or less and only 5% are greater than 4 hectares. In Gofa Awraja a study determined that 50% of the households owned cattle (an average of 3.9 cattle/household). In the higher elevations of the awraja sheep and goat holdings are more predominant.

1) Impediments to Agriculture Development in Gemu Gofa

In general, the practice of agriculture in Gemu Gofa can be characterized as tradition oriented and underproductive. There is considerable scope for agricultural development in the province but the following are required in order that the agricultural potential of the province be realized:

a) More Potentially Cultivatible Land Should be Put Into Production

The majority of the population lives in the heavily congested highlands while the fertile lowland valleys remain lightly inhabited. An estimated 150,000 - 175,000 hectares of uninhabited or lightly populated lowlands are available for settlement. Some is irrigable and some is suitable for dryland cultivation.

b) Malaria and Tsetse Fly Must Be Controlled

Movement of excess highland populations into the lower areas requires the control or eradication of these health hazards.

c) Increased Agricultural Inputs and Services

Lack of agricultural inputs and services is a major constraint to agricultural development in the remote, roadless areas of most of Gemu Gofa. EPID maintains the following branch offices in Gemu Gofa:

Awraja	Veterinary	Agriculture	Forestry	Planning
Gamo	9	8	2	-
Gofa	5	1	2	1
Gardulla	6	3	-	1
Hamer-Bako	5	7	-	-
	25	19	4	2

Most of these offices have very little contact with the outside world. The Berger Consultants found that the office in Geresse was limited to a monthly pack mule visit bringing salary checks. In Celta, an EPID agent told the team that in his 20 months on the job he had not seen a vehicle come to town. Most EPID agents interviewed by the team cited the principal reason for not being able to get inputs such as fertilizer to the farmers as the lack of roads.

Because of only periodic contact between branch offices and the provincial agricultural people, it is felt that the effectiveness of these remote branches is minimal. They normally have to rely on their rudimentary technical training and very little else. The capability of these remote EPID offices to measurably improve the lot of the peasant farmers they are meant to serve is not very great.

d) Improvements and Expansion in the Marketing Structure

The marketing pattern in Gemu Gofa revolves around main marketing centers and lesser satelite marketing towns. The former are located on some form of road, the latter are not. The local inhabitants walk up to 30-40 km to a main marketing center on market days in order to buy or sell their produce. Goods are nearly always transported on animal or human backs. The marketing system is such that there is little incentive to produce much more than the family can consume. On-farm storage or excess production even if it were widely practiced would be of little benefit to the farmer because of the lack of transport of more than a small level of this excess production to regional markets, and the further lack of transport from these regional markets to more centralized markets within and outside the province.

b. Gojjam

The estimated 1977 population of Gojjam is 2,288,000.

Estimated Population Gojjam (1977)

Awraja	(000)
Agew Midir	185.1
Bahar Dar	574.2
Bicheno	192.9
Debre Markos	378.0
Kola Dega Damot	483.9
Metekel	130.5
Mota	343.5
Total	2,288.1

The population growth rate for the province is estimated by the Central Statistice Office at 3.7% per year but the data are very unreliable and the actual rate is likely to be at variance from the CSO estimated.

The population densities vary with elevation, as in Gemu Gofa, with the densest populations located in the upper highland areas (above 2,200m) in the east followed by the middle highlands (1400-2200m). The western third of the administrative region is a hot, malarial, sparsely settled lowland.

The predominantly Amharic-speaking rural population of Gojjam traditionally, and for the most part still, lives in dispersed extended family compounds. Clustering normally occurs around small markets and parish churches. Towns in Gojjam have developed largely as a result of the administrative requirements of the national government.

The major towns are:

Town	Population (1971)
Bahar Dar	22,265
Burie	6,197
Bichena	3,715
Debre Markos*	27,093
Debre Work	3,517
Dejan	3,947
Dembecha	2,756
Fenote Selam	5,527
Mertole Mariam	2,786
Motta	4,665
Total	82,468

*Provincial Capital.

On the basis of these figures, Gojjam was about 5% urban in 1971. Six of these towns lie along the only main road in the region between Dejan and Bahar Dar. The remaining four, Bichena, Debre Work, Mertole Mariam and Motta are in the far eastern edge of the region close to the Blue Nile Gorge. All except Mertole Mariam will be linked to the existing highway by the Dejan-Motta roads now under construction. When this latter road is completed, only the capital of Metekel Awraja, Chagni, will not lie on one of the two main roads in the region. Most of these towns have become market and commercial centers. The only significant industry in the region is the textile factory located in Bahar Dar which employs about 4,000 workers. Most of the other towns support some small manufacturing and limited agricultural processing. Several of these towns have over 20% of their populations engaged in agriculture or animal husbandry.

The per capita income of Gojjam is estimated to be below the $100 figure for the country as a whole but above that for Gemu Gofa and the average for the rural areas generally. The 1977 GDP of Gojjam is very roughly estimated at $150 million.

Employment is broken down thus:

Occupation of Population (10-59 years of age) 1974

Agriculture	92.3
Administration	.1
Professionals	.4
Draftsmen	.3
Traders	1.1
Tej/Tella Makers/Sellers	1.4
Services	2.0
Other	2.4
	100%

As with Gemu Gofa, more than 90% of the population is engaged in agriculture. Unlike Gemu Gofa very few are pastoralists (although many own or share ownership in draft animals). Subsistence farming predominates with the average holdings ranging from 1-1.5 hectares. The principal crops in Gojjam are: Teff (38%), Millet (14%), Barley (12%) and Sorghum (10%).

Yields for Major Crops 1975/76 (Quintals/Hectares)

	Teff	Barley	Wheat	Maize	Sorghum	Millet
N.W. Region (including Gojjam)	4.4	4.5	4.8	5.7	6.0	6.6

(Source: Min. of Agriculture Crop Production Survey 1975/76.)

The yields per hectare, as reported, are considerably less than those shown for Gemu Gofa. Whether this is a true reflection, a one year phenomenon or some problem in the collection or reporting of data is not known. Generally, Gojjam is a surplus producer of cereal crops and exports a considerable portion of its output to Addis Ababa. Gemu Gofa, with a population roughly half of Gojjam is a net importer of foodstuffs. EPID estimates total cereals production of Gojjam to be 231,000 MT in a "normal year" or 6.1% of total Ethiopian production. Gojjam, with double the population of Gemu Gofa produces three times the agricultural output of the latter province.

The major need in Gojjam is to increase unit agricultural yields through the introduction of intensive agricultural methods. Unless this is done, population pressure will drive people into less productive marginal land with consequent loss of pasturage for the numerous draft animals and increased erosion--already a severe problem. There still exists, however a large reservoir of fertile soils and first class agricultural land available. The need is to improve access into much of the region.

The province is not fortuitously situated with respect to the big urban centers. The province is very poorly supplied with even dry weather roads. In order to achieve its potential to market considerably increased production outside the province, the MPP II program needs to be introduced to considerable portions of the province not now reached by EPID programs. This will require the expansion of the rural roads program envisioned in the 5-Year Rural Roads Program.

5. The AID Project

As was indicated earlier the project is not of the type where benefit/cost analysis is directly applicable. Rates of return cannot realistically be calculated because the benefits to be derived by the target population do not accrue directly from the rural roads project itself but from the increased availability of Government agriculture improvement, marketing, education and health programs which the existence of the roads will foster. The measurement of these benefits will be accomplished as a part of the design efforts of these other projects taken together.*

In selecting the rural roads in each Administrative Region for inclusion in the 5-Year Rural Roads Program, the Crown Agents and the Rural Roads Task Force utilized a set of socio-economic criteria described earlier

*AID is participating in the design of MPP II and Non-Formal Education for FY 1978 initial funding. Additional AID programs which will yield direct benefit to the rural poor and which will be enhanced by the rural road project include: Gemu Gofa Rehabilitation, the RRC Early Warning System, Population, Health and several others.

to rank roads requested for construction by the Provincial Rural Roads Committee of each Province.

The roads included in the AID-financed project are the highest priority roads in the Crown Agents' listing excluding those which are already being constructed or are scheduled for construction under other auspices.*

a. Specific Roads - Gemu Gofa

1) Arba Minch (Rd)-Kamba-Gelta-Felege Neway (RR10 Standard)

This road connects the awraja capital of Gofa Awraja, Felege Neway, with the capital of the Administrative Region, Arba Minch. It was given high priority by the Crown Agents (2nd of 22) because linking awraja to provincial capitals was assigned double the weight of the other factors included in the list. The awraja capital is vitally important in establishing government development and social services. Linking the awraja to the provincial capital opens an important channel for trade as well as communication.

The road is 167 km long. There is an argument for constructing this road to RR30 standard (all weather) so that the awraja capital would not be cut off in the rainy season. However, there is an ERA all-weather road to connect Sodo to Jinka (with a spur to Felege Neway) now under construction which will allow connection to Arba Minch; although nearly 2½ times as long and travelling through Sidamo province. If the actual traffic on the Arba Minch-Kamba-Gelta-Felege Neway Road, once it is operational, is observed to be sufficient for upgrading to RR30 it would be a candidate for such upgarding in the post-1980 period. There is an existing roadbed already in place built by the Italians 40 years ago. It is now nearly impassable except to 4-wheel drive vehicles in the dry season at speeds of less than 5km/hr. Much of the work of this construction project will be to make the road passable again. By using the existing road bed, construction costs will be under what they would have been if a new road were constructed from scratch.

The road passes through some of the more heavily populated portions of the Gemu Gofa highlands and will connect numerous local and satellite markets to Arba Minch and via Arba Minch (or via Sodo) to the agriculturally important area of Shashemane and to Addis Ababa.

2) Arba Minch/Sodo Rd. - Chencha (RR10 Standard)

This road will be 25 km long. It was ranked 3rd of 22. There is a road already in existence which has deteriorated in parts to the point where it is useable at very low speeds only in the dry season. The

* Roads high on the lists for the two provinces which the consultants were not able to appraise because of security problems had to be excluded for now. These were few however.

project will repair the road and construct adequate drainage. The road may eventually be built to RR30 standard by building up the surface of the southernmost 5 km with select materials. The remainder of the road should prove passable even in the rainy season. This is the most densely populated area in the province and improved access to Arba Minch and outside markets is required.

3) Gidole (RD) - South of Lake Chamo to Sidamo (RR10 Standard)

This road is 50 km. It ranks 5th of 22. The principal economic justification is to link an important rangeland area of Gemu Gofa into the IBRD/AFDG-financed Southern Rangelands Project. The road will aid in the marketing of cattle either via Awassa (the marketing route for the majority of the Rangelands project which covers Sidamo and Bale Provinces as well as the portion of Gemu Gofa to be serviced by this road) or via Arba Minch.

4) Turmi-Murle (RR10 Standard)

This road is 60 km. It ranks 6th of 22. The economic justification is that it provides access to the high potential Omo River Valley. It would be the only road into central Hamer Bako Awraja. As such it is important also for the AID-financed Gemu Gofa Development project which will provide agriculture inputs, tsetse eradication and malaria control to the traditional agriculturalists already in the area. It is an area where small scale experiments have already shown a high potential exists for irrigated agriculture. The road will provide some access to the northern portion of the Omo Game Reserve which lies to the south of Murle.

5) Jinka to Mago Park Headquarters (RR10 Standard)

This road is 45 km. It was ranked 7th of 22. It will provide access to the proposed Mago National Park which the Ethiopian Wildlife and Natural History Society has recently reported to be ". . .Ethiopia's richest and finest remaining wildlife country in both variety and numbers of species."* While the park is not yet threatened by human settlement it is already subject to poaching for elephant tusks and giraffe tails. The road would assist the establishment of a park headquarters and increased protection. In the face of Ethiopia's rapidly dwindling wildlife resources this is the country's last remaining large concentration of wildlife. The park, when established would provide employment opportunities for local inhabitants. Revenues from tourists would accrue to local Peasant Associations. Much of the length of the road passes through already settled areas which would have access to markets in Jinka and beyond for their produce.

* EWNHS Newsletter No. 121 June, 1977 p. 6.

b. Specific Roads - Gojjam

1) Wetet Abay - Daghi (RR10 Standard)

This road is 17 km long. It ranked 6th of 33.* It will connect the important market town of Daghi to the existing Bahar Dar-Debre Markos road at Wetet Abay. The area is fairly heavily populated (30-60 persons/km^2) and is an important teff, barley and wheat producing area.

2) Debre Markos - Erob Gebeya (RR10 Standard)

This road is 40 km long. It was ranked 11 of 33.** It is the first of two segments of road which will connect the capital of Mota Awraja, Mota, to the provincial capital, Debre Markos. It passes through highland teff, barley and wheat growing areas with population densities ranging from 30-60 persons/km^2. It will greatly improve the nearly impassable dry weather road which now exists between these two towns.

3) Minase Kola - Berekt (RR10 Standard)

This road is 25 km long. It ranked 13 of 33. It will connect the local market town of Berekt to the main Bahar Dar road. The area is similar in all respects to that of the Wetet Abay-Daghi road above.

4) Erob Gebeya - Mota (RR10 Standard)

This road is 65 km long. It ranked 14 of 33. It completes the connection between Erob Gebeya and Mota, the awraja capital.

5) Bichena - Shebel (RR10 Standard)

This road is 25 km long. It ranked 16 of 33. It will connect the important local market town of Shebel to the awraja capital, Bichena and to the all weather Bichena-Dejan road. This is one of the most densely inhabited portions of Gojjam province with from 60-120 persons/ km^2. Like all of the highlands of eastern Gojjam it is a teff, barley, wheat producing area.

6) Bulched - Yejube (RR10 Standard)

This road is 35 km long. It ranked 18th of 33. It connects the important market town of Yejube in the far south of Debre Markos awraja with the main Debre Markos-Addis Ababa Road.

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* Roads ranked 1-5 are already included in the ERA Feeder Road Program.
** Roads ranked 7-10 are already included in the ERA or EPID road program.

7) Fagita - Dangia/Fafa (RR10 Standard)

This road is 25 km long. It ranked 19th of 33. It serves to complete the connection between the EPID Addis Kidame-Fagita Road and EPID's Tilili-Fafa-Sekela Road in central Gojjam. The area has a population density of 15-30 persons/km^2 and, as with preceeding roads is in the teff, barley, wheat producing highland zone.

8) Mota/Bichena - Mertole Mariam (RR10 Standard)

This road is 25 km long. It ranked 21st of 33. It connects Mertole Mariam with the all weather road (presently being upgraded from a dry-weather road by ERA) from Mota to Bichena. This road will also help provide access to the even more remote towns of Debo and Matya on the Blue Nile escarpment. (These would seem to be prime candidates for Peasant Association self-help roads.)

9) Chagni - Debate - Debre Zeit (RR10 Standard)

The total length of this road is 105 kms but during the 1978-80 period it will probably only be possible to begin work--making progress not quite to Debate. It ranked 22nd of 33. Work to Debre Zeit would continue in the post 1980 period utilizing the AID-financed equipment. This road would improve the existing dry weather track to Debate and would eventually connect remote Debre Zeit in the lower elevations of southwestern Gojjam to the main road network in the eastern half of the province. In all of Metekel Awraja which comprises half of Gojjam Administrative Region there is presently no road of higher standard than a few 4-wheel drive dry-weather tracks. (ERA is now beginning construction on the Chagni-Guba-Alamkal Road.)

c. Comment

The 14 roads listed above represent only a tiny minority of the roads that need to be built into these remote, nearly roadless hinterlands. They represent a start of a lengthy period of rural roads construction. They have been selected by an amalgam of PRRC desires, CA socio-economic priorities, RRTF perceived capabilities, Berger Consultants' abilities to appraise actual roads, other agency priorities, available scarce manpower resources and several other variables as well. It would be sterile to argue why these and not others, because there are undoubtedly other possibilities, equally deserving, in the two provinces. These roads are as close as presently possible to a concensus regarding a starting group and while it will not prove possible or cost effective to undertake benefit/cost analyses, there is sufficient socio-economic justification to commence construction now on these simple but critically important roads.

d. Least Cost Approach

Several aspects of the project attempt to minimize costs.

1) Technical Services

The use of full-time expatriate technicians has been kept to a minimum. The original list has been pared from 18 man years to 11 man years by combining three proposed engineering positions into one experienced, broadly-based road engineer. The supply and procurement advisory job has been cut from the originally proposed 3 years to 1 year. Many of the technical assistance roles will be filled by short-term consultants rather than full-time advisors.

2) Training

The project relies heavily on the expanded training facilities being financed by IDA. Project inputs are limited to certain aspects of rural road training considered essential and not provided under the IDA credit. A considerable portion of the training will be on-the-job with periodic follow-up inspection visits by the AID-financed rural roads construction.

Overseas academic training has been eliminated as a luxury which cannot be afforded at this time. Out of country training is short-term observation in developing countries.

3) Equipment

The largest and most costly element of the project is the road and shop equipment. A number of steps have been taken to insure that the minimum amount of equipment necessary for the construction and maintenance units in the two provinces to achieve the annual output levels discussed in the technical analysis section. As a first step, AID financed a detailed province-by-province inventory and rehabilitation study of non-ERA road equipment* to determine what might be available to the RRO at what rehabilitation costs. In Gemu Gofa 24 pieces of equipment were investigated. Some of these are operational but need repairs and maintenance. Other pieces, while deadlined, could be brought back into service with spares, repairs and servicing. A similar situation exists in Gojjam where 41 pieces of equipment belonging to various non-ERA entities were investigated. While the majority are not useable, some are and will be rehabilitated.

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* Farrar, Donald (Louis Berger International, Inc.) Inventory and Rehabilitation Report Non-ERA Highway Equipment, (November, 1976)

On the basis of the Farrar report the RRTF has proposed to the Council of Ministers that the RRO be granted use of equipment owned by the Administrative Regions. RRO would rehabilitate the equipment and agree to use it for rural roads activity within the province that owns it. The Council of Ministers has reacted favorably on the request and procedures are now being developed. Use of the existing equipment will reduce total project costs by reducing the amount of new equipment required for a period of time equal to the useful remaining lifetime of the major pieces of equipment rehabilitated.

With regard to the new equipment requirements, these were first spelled out by the Crown Agents, reviewed in great detail (and in some cases reduced) by the RRTF then further reviewed by the Berger Consultants (who proposed the "Light Construction" and "Augmentation" concepts as a more efficiently and less costly use of equipment) and USAID and REDSO engineers. The final list of 170 pieces as shown in the technical analysis section represents a conscientious attempt by all parties to derive the most economical equipment package possible.

Given the leadtime required for the equipment to arrive on site, and the projected continuing inflation of prices, it is not deemed practical to delay procurement of any of the equipment and all will be ordered soon after signing of the Project Grant Agreement.

4) Road Construction

All roads constructed under this project are being built to the lowest and least costly standard--RR10. The use of structures is being kept to the minimum. Most streams will be forded, most cross drainage will be by drift. In heavy rock, the road bed will be narrowed to 4m to reduce the cost. While the estimated average per kilometer costs as indicated earlier may seem to those who have not seen the Ethiopian countryside to be high, it is, in nearly all cases, the lowest possible cost to build these minimal standard roads in the rugged, hilly to mountainous terrain of the two provinces.

The mix of unskilled labor and equipment is a compromise between the need to involve local laborers and the need to keep costs down and achieve a reasonable time-table. In Ethiopia the financial cost of labor intensive road work at Birr 2/day per unskilled laborer can make for very costly roads indeed--even for minimum standard roads such as these. Even when the economic cost of unskilled rural labor is shadow priced at a factor of .5 (representing the seasonal nature of the opportunity cost for rural labor in Ethiopia generally) the labor cost of very labor intensive roads in Ethiopia's highland

mountainous terrain still does not compare favorably for many tasks with that of equipment such as cutting, long-distance hauling, etc. There is also a time factor. Use of any more labor than contemplated would prolong construction by as much as 700% and thereby decrease benefits to the larger portion of the local population. The program already involves many, many years to achieve its total objectives. The solution so far in this project is to use labor for those tasks wherever it is economically feasible to do so (clearing, grubbing, drainage and very short haul work) and use equipment in the remaining tasks. For road maintenance, a permanent, locally recruited maintenance force of unskilled laborers is found to be a cost effective method of accomplishing ordinary maintenance. For both construction and maintenance, labor arrangements will be worked out with the local Peasant Associations which should assure a greater optimization of both employment needs and speed of road construction.

5) Other Construction

The central headquarters offices are to be contained in a single, modest structure on the grounds of the present ERA complex. The cost of $300,000 to be funded by the Ethiopian Government is reasonable and moderate.

The Provincial Headquarters are also to be constructed at minimal cost using indigenous labor and materials. The Berger Consultants suggested some modifications to the original Crown Agents layout and the Government has accepted these modifications. The costs of establishing road construction camps will also be kept to a minimum.

e. Improved Capability

This chapter has dealt necessarily with the roads to be constructed. The more important purpose of the project however remains that of an increased long term Ethiopian capability to build and maintain rural roads and the decentralization of this capability to the provincial level. The improvement will be measured, of course, by the end product--roads constructed and maintained, but it is easy to focus too much on the end product and not enough on the process by which the capability itself is enhanced. It is especially difficult when viewed from an economic perspective.

The process of developing the institutional, technical and management capability to plan, implement, monitor and evaluate a national program of this scope and magnitude involves the reassignment of key experienced personnel from elsewhere in the government; the training of new skilled and professional people over the period of 5-7 years; the expansion or creation of facilities; the development and implementation of procedures and the organization of information flow and feedback. These processes

are largely the responsibility of the Ethiopian Government and specifically of the leadership of ERA and RRO. IDA and AID will be providing technical expertise and training to assist in this process and will monitor and evaluate the rate of progress. The fact that the processes by which improved capability is engendered are not much mentioned in this chapter should, thus, not be construed as indicating their relative lack of importance.

IV. IMPLEMENTATION ARRANGEMENTS

A. Administrative Arrangements

1. Ethiopian Government

The Council of Ministers has approved the Rural Roads Task Force's recommendation for the establishment of a semi-autonomous Rural Roads Organization (RRO) to be established within the Ethiopian Road Authority. The existing Rural Roads Division (RRD) will form the nucleus of the RRO which will be operational before January 1, 1978. (See Chart I of Chapter II above.) The new organization will have access to ERA facilities and services (e.g., district workshops, procurement, training, financial administration and technical advisory services) but will have considerably more autonomy than a normal ERA Division (e.g., RRO will do its own recruitment of personnel, will do its own planning, have its own equipment and set and maintain its own standards). It will also be more decentralized and more dependent upon locally expressed desires in establishing its works program.

Provincial Rural Roads Offices (PRROs) will be established gradually in each Administrative Region and decision-making autonomy transferred to these offices (utilizing guidance provided increasingly by the local Provincial Rural Roads Committees and local administrations) as they develop the local capacity.

a. RRO Management Capability - General

The management capability of the RRO has, of course, not yet been proven but there are a number of indicators which suggest that the new organization will start life with considerably better than average prospects for good, solid planning and implementation capacity.

First, the existing RRD in its construction of rural roads in drought areas, for EPID and, importantly, in two Peasant Association self-help efforts, has proved it has the capability to organize and implement rural roads programs.* The drought road construction programs, particularly in Wello and Gemu Gofa, have also made a good start toward establishing provincial rural roads organizations and familiarity of construction programs and their problems by local administrators and Peasant Association leaders. In Gojjam, two EPID rural roads construction efforts have also provided valuable rural roads experience.

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* Security problems have forced curtailment of construction on drought roads in Bale and Sidamo. There have been labor problems (now resolved) and some on-site management difficulty. Nevertheless, in the present Ethiopian context, RRD has generally done a commendable job.

Second, the RRD has prepared the rural roads component of the 5-Year Highway Sector Program. The work, relying on the Rural Roads Task Force and Crown Agents' Reports, is complete and realistic; and the proposed program appears workable. RRD worked closely with the Planning Division of ERA in its preparation.

Third, the RRO will be responsible for one of the highest priority development programs in the Government's development portfolio. As such it has a priority call on the time and efforts of senior government officials in the Ministries of Finance, Interior and Agriculture and in the Planning Commission. Budget requests will get sympathetic consideration and problems that inevitably will emerge will get high level review and immediate moves toward resolution.

b. Likely Problem Areas

The problem areas will most likely occur in coordination with the Highways Organization. The most serious problems will be in procurement, warehousing, inventory management and ordering and distribution of spare parts for equipment to the provinces and, finally, in establishing relatively rapid equipment repair procedures. In these areas, RRO will rely to a considerable degree on existing Highways facilities which currently need improvement.

Such improvement will come about in two ways. The IDA-financed Transport Sector Credit provides for technical assistance and a considerably expanded training effort to help overcome skills shortages in key areas. AID, on its part, will provide a short-term Organization Management Specialist to help RRO establish internal procedures, controls and systems. He will propose methods of optimizing working relationships with Highways. Second, an equipment man will be provided to help set up first, second and third echelon maintenance and repair capability in Gemu Gofa and Gojjam PRROs. Third, assistance in procurement, warehousing and inventory management for the RRO will be provided by a consultant and specific training programs will be established at the Alemgena Training Center by short-term consultants aimed at overcoming known skills deficiencies in the RRO.

c. Capability to Select, Award and Administer Contracts

ERA has a proven record as being quite competent in this area insofar as equipment procurement and construction contracts are concerned. Both AID and IDA have been generally quite satisfied with ERA performance in these areas. ERA will provide these services to both the RRO and Highways.

With regard to selection of a firm to provide technical expertise to RRO under the AID Grant, it is the opinion of both RRD and USAID that a direct AID rather than an RRO host country contract is preferable in this first phase of AID assistance for Rural Roads. First, it is felt that AID will have a more favorable response from perspective firms under its RFP procedures than would RRO* because of generally unfavorable publicity regarding the Ethiopian situation over the past several months. Second, RRO will be in the process of working out its own internal personnel procedures and to have to deal with the requirements of expatriate contractors in the first year or two of its existence would create an undue burden on scarce management and personnel resources. Indeed, the O&M Consultant to be provided by the project will help set up procedures to enable the RRO to eventually undertake its own contracting for personnel services. For the immediate future, and in the present context, an AID direct contract is the most sensible procedure.

d. The Administrative Environment

The Ethiopian Government strongly endorses the Rural Roads Program. The Rural Roads Task Force, composed of senior representatives of Finance, Planning Commission, Relief Commission, Agriculture, Transport and ERA was largely responsible for making the policy decisions which underlie the 5-Year Program. Throughout the Government, support is strong. The difficulties ahead lie in the imperative need for coordination; horizontal coordination between development agencies with their individual requirements for the roads; and vertical coordination among central government and local administrative organs. To this point, general coordination has been good. The process of road selection has taken into account the requirements and/or desires of the PRRCs (as representatives of provincial and awraja requirements) and of the development agencies for their own future programs (to the extent future programs are known). The impetus and support exist. Coordination through the planning phase has been achieved. The test will be in the ability to continue coordination during the more difficult implementation phase.

e. Administrative Arrangements to Reach and Involve the Target Population

The decentralization of management and responsibility for rural roads to the PRROs is the principal mechanism for involving the local populations. Elected representatives from the Peasant Associations will sit on the Provincial Revolutionary Development Committees and the Provincial Rural Roads Committees which will eventually prepare the rural roads program proposals in each province. The decentralization of RRO itself will be relatively slow, reflecting the present lack of professional and skilled

* RRO rather than ERA will be responsible for actually selecting the contractor under host country contracting procedure for personnel assigned directly to RRO.

people to fill local positions. The rate of future decentralization has been determined based primarily on the estimated training outputs in various skill categories over the next 5-7 years. Once the process of decentralization is completed, the role of the Central Headquarters will be to collect the budget proposals of the PRROs, present them to the Board of the RRO (composed of most of the same officers who constituted the RRTF) then the PCO and Ministry of Finance. The Central Offices will also continue to provide procurement, spare parts inventories, coordination with Highways, and skilled and professional staff recruitment. The PRRO would manage the construction and maintenance program, allocate resources to the self-help roads and coordinate with the Provincial level offices of the development agencies. The PRDC and PRRC (the latter would probably be a sub-committee of the PRDC) would determine the roads lists and prioritize them before presenting them to the PRRO and the RRO for review, minimal changes (based on development priorities that were of more national scope) and funding. Full implementation of this process is 4-5 years away for Wello and Tigre, 5-6 years away for Keffa, Illubabor and Gojjam and 6-8 years away for other provinces.

2. AID's Administrative Arrangements

No unusual administrative arrangements are contemplated. USAID/Ethiopia will soon recruit an Ethiopian engineer to add to its staff to monitor this project and several others with engineering components. REDSO/EA will provide backstop engineering by an American engineer. An officer in the USAID's Rural Development Division will be assigned Project Management responsibilities.

a. Disbursement Procedures

(1) Foreign Exchange

Disbursement of funds for all equipment supplies and related services procured in the U.S. will be by the letter of commitment/letter of credit method of financing.

(2) Local Currency Costs

For those items purchased under the "off-shelf" procedures in Ethiopia and for all other local currency expenditures, disbursements will be by the direct reimbursement method of financing.

(3) Technicians

The technicians required for the project will be funded under direct AID contracts and disbursement will be by AID.

b. Required Reports

The Rural Roads Organization will submit the following reports. (The Technical Assistance Team may be required to assist in the preparation of these reports.)

1) Monthly Construction Progress Report
2) Monthly Maintenance Progress Report
3) Quarterly Project Progress Report
4) Quarterly Shipping Reports
5) Quarterly Financial Reports
6) Annual Progress Reports
7) Annual Financial Reports
8) Final Project Report
9) Other reports that may be required from time to time by AID.

B. Procurement and Other Implementation Planning

1. Procurement Plan

The Ethiopian Roads Authority (ERA) will be responsible for all procurement under the Grant, and will carry it out in accordance with the procedures set forth in AID Handbook 11, Country Contracting. The ERA has experience in procuring construction equipment and supplies under AID financed projects and is familiar with AID procurement procedures. Detailed specifications for most of the equipment are readily available, since ERA recently procured the same types of equipment under another AID financed project.

The authorized source of procurement under the Grant will be the U.S.A. (AID Geographic Code 000) and Ethiopia. Details of the procurement of the various commodities required for the project are as follows:

a. Equipment

All equipment will be procured from the USA, with the exception that certain small value items, such as shop hand tools, will be procured off-shelf in Ethiopia; this procurement will be in accordance with the "off-shelf" procedures set forth in Handbook 11, Attachment 3H. Also, the equipment list includes 32 four cubic yard hydraulic tipping trailers which are not available from the U.S.; therefore, it is requested that a source waiver be authorized to procure these units (valued at approximately $4,500 each), from A.I.D. Geographic Code 935 sources. A similar waiver was just granted for these items under the Ethiopian Recovery and Rehabilitation Grant.

b. Spare Parts

At the time of the solicitation of bids for theequipment, bidders will be requested to submit a recommended list of spare parts for their equipment,

against which the ERA will issue orders at a later date. Although most of the spare parts will be procured from the U.S., it is anticipated that there will be instances when parts not available from the inventory will be required on an urgent basis; such parts will be procured off-shelf in Ethiopia, or air freighted from the U.S. or bonded warehouses.

c. Construction Unit Hand Tools

The construction unit hand tools will be procured in Ethiopia. Most of these tools are manufactured in Ethiopia; however, a few of the items may be of 899 origin and as such would be procured under normal "off-shelf" procedures.

d. Construction Materials

All construction materials will be procured in Ethiopia and will be of local manufacture.

e. Excess Property

The Excess Property Division of AID will be approached concerning the availability of suitable equipment for the project.

2. Implementation Plan

a. General

Project approval and authorization is required by August 31, 1977. Working level negotiation of the Draft Project Grant Agreement will occur during August. Once authorization has been granted, full negotiation of the Grant Agreement will require approximately 3 weeks in September, 1977 with signing (and obligation) prior to the September 30 end of the fiscal year.

The detailed implementation schedule is presented in Annex N. It is a proposed schedule prepared by the USAID Engineer. It will be subject to negotiation and an agreed to revision will be included as an attachment to the Grant Agreement. At that time it will also be redone in a PPT format. During negotiation AID will require that the following be adhered to:

1) there be no slippage in the time schedule for ordering equipment and technical services. RFP and IFBs must be completed no later than the dates indicated in the draft at Annex N.

2) targets for establishing the Provincial Rural Roads Offices, in terms of personnel assigned once agreed to, must be met. This is an important indicator of the pace of decentralization.

3) a systematic process for receiving and reviewing self-help roads requests must be established prior to January 31, 1978 at the Central RRO and devolved to the Gojjam and Gemu Gofa PRROs by January 31, 1980.

4) agreement on the use of Highway District Workshops at Debre Markos and Shashamane for echelon IV, V and VI equipment maintenance and repair should be achieved within 6 months of the official establishment of the RRO.

b. Schedule of Arrival of Contractor Technical Personnel

The road engineer (who will serve as chief-of-party for the contract team) will arrive as soon as possible after the contract is signed. The equipment specialist, procurement and supply specialist and the long-term trainer will arrive approximately 60-90 days after the road engineer. The short term training specialist will arrive according to a schedule to be determined during Grant Agreement negotiation. The final schedule for technical assistance arrivals and subsequent timing will be an attachment of the Project Agreement. Work plans for each technician will be done in draft at the time of submission of the PIO and finalized with the participation of the involved technician within 30 days after arrival at the duty station.

c. Waiver Required for Longer than 3-Year Disbursement

This project is a capital grant and FAA Section 110(b) requires that disbursement be limited to 3 years from the obligation date. A waiver of this section is hereby requested. This project will require a disbursement period of approximately 4 years to accommodate final contractor billing for the provision of the technical assistance component of the project. It should be noted that disbursements for all capital items will be accomplished within the 3 year period. The project calls for three-year tours for two key advisory personnel. These tours will commence no earlier than May, 1978, eight months after signing of the Grant Agreement because of legal requirements for advertising, submission of proposals, contractor selection, contract negotiation and recruitment of required personnel. The technicians will depart 3 years and 8 months from initial obligation (or possibly even two or three months later) and final disbursements for contractor services would be one or two months after that. Since the time period for these services is deemed essential to project success, a waiver of the 3 year disbursement limitation is required, presumably at the time of project authorization.

d. Project Monitoring

Monitoring project progress will be accomplished principally through the preparation by various RRO units of the reports required in Section A.2.b. above. In addition the USAID will soon employ an Ethiopian engineer who,

in concert with the Mission Project Officer, will develop a periodic inspection schedule. He will be assisted on an as needed basis by the REDSO/EA engineering office.

The scope of the monitoring activities will be as follows:

1) Productivity and the relationship between productivity and cost for:

a) construction units; and
b) maintenance units.

2) Extent of labor and/or equipment intensiveness. Ultimately, with sufficient experience, data, and identification of those factors supporting each type of intensiveness, guidelines will be issued for future projects.

3) Quality of roads and/or rate of deterioration. General factors to be considered are design standards, environmental soundness of construction, criteria for materials, climatic effects, distribution and type of traffic, service ability index. Specific quantitative units of measurement to be taken over a period of time including CBR, moisture content, density, formation dimensions, camber, performance of drainage structures, etc.

4) Local improvements, economic and social, arising from road construction, e.g., employment, local cooperation, government services, etc.

5) Scope of monitoring operations. The monitoring personnel will be entrusted with careful recording of prototype conditions; but will not be problem solvers and will not issue instructions.

They must not be influenced by the construction superintendents who might interpret reporting of non-achievements as personal reflections of their abilities. On the other hand the monitoring personnel must not be so over-zealous that their reporting tends to force the construction supervisors into rigid rule following.

The program, if effective, will aid the planners, designers and construction persons evaluate their successes and failures in order to achieve higher levels of competence. This will require considerable give and take between all parties.

6) The above information will ultimately form the basis for future modifications to design, equipment and/or labor use, roadway standards, etc. It will also provide an extremely useful body of much needed data for future rural roads programs in Ethiopia and elsewhere.

7) Monitoring of complementary activities.

Data would ultimately be collected for all ERA construction and maintenance activities. However, in the first instance efforts would be concentrated on the Rural Roads Offices to be established in Illubabor, Keffa and Wellega (IDA-financed).

In respect of 3) above data would be collected on a representative sample of rural roads. Specifically, the following information will be collected under ongoing research projects:

a) rate of deterioration measured by gravel loss, average rut depth and surface roughness estimates;

b) performance of roads with different design parameters;

c) performance of roads with different compaction and drainage standards;

d) rainfall and number of days closure by road; and

e) frequency and type of recurrent and periodic maintenance.

8) Assistance in the total monitoring functions would be secured from other on-site Ethiopian Government Agencies.

e. Logistic Support

1) All logistic support for the project (excluding items in paragraph 2) below) including port clearance, payment of port fees, duties, etc., of project commodities will be the responsibility of the Ethiopian Government. The cost estimates in Annex B and F include estimates for support costs in the non-personnel and POL line items. All estimates, however, are net of taxes and duties which are internal transactions of the Ethiopian Government.

2) Logistic support of the four long-term and three short-term contract experts will be the responsibility of the contractor. However, due to the shortage of housing and other problems in Ethiopia at the present time the USAID will be as helpful as possible in assisting the contractor to locate housing, locally manufactured furniture and clearing of effects. The extent of this assistance will be clearly indicated in the PIO.

f. Contracting

1) Contracting relating to equipment and all local procurement will be the responsibility of ERA using normal ERA contracting procedures which are in conformity with AID Handbook 11.

2) The contract for Technical Services will be an AID Direct (probably cost reimbursement) Contract with an American firm that has experience in rural road construction in the developing world. Normal solicitation procedures would apply, with a presolicitation conference of likely bidders desireable. Dates of availability of qualified personnel will be an important factor in evaluating proposals, as will experience in similar type situations in other countries.

g. Unresolved Issues or Problems in Implementation

The draft implementation plan (Annex N) is subject to further review and negotiation with RRO. The final agreed to version will be incorporated into the Grant Agreement as an annex. While there will likely be relatively minor modifications in the general section with regard to arrangements for input arrivals, the major discussion, of a more technical nature, will involve the provincial implementation (construction and maintenance) schedules. If actual experience during the first 18 months of the project indicates that the implementation targets are unrealistic, provision will be included to replan targets for the second 18 months of the project.

C. Evaluation Component

Current plans are to evaluate the roads construction activity as follows:

1. Project Evaluation Summary (PES)

A PES will be prepared after the first nine months of project implementation. This nine-month period of project activity will be devoted primarily to project mobilization and start-up. Although a full scale evaluation of project progress at this stage would be little or no utility, a PES would serve the purpose of examining, early-on, key assumptions and other start-up activities necessary for successful project implementation. Included in the PES would be an assessment of environmental protection being practiced in the program.

Specifically, the following items will be examined:

a. Progress of RRO in securing maintenance and labor personnel for the project in sufficient number. Delay in project implementation resulting from a failure to recruit same.

b. Progress of RRO/AID training programs, including

1) Recruitment of participants to be trained

a) in Third Countries
b) at Alemgena Training Center

2) Expansion of Alemgena Training Center

c. Progress of recruiting of Expatriate Specialists. Evaluation of their inputs to the project.

d. Willingness of local Peasant Association members on RRO construction and maintenance projects and self-help roads. (For example, if labor is imported, are there any visible signs of distinction between different ethnic groups especially to the extent that project progress is impeded?)

e. Progress of PRROs, specifically

1) compound construction,
2) establishment and effectiveness of PRR Committee,
3) assignment of qualified staff.

f. Any new knowledge, after six months of implementation, especially of a technical or environmental nature, that significantly changes scope of project (routings, cost estimates, time required for completion, etc.).

At the input level, progress on the following will be examined.

1) Commitment of GOE to activity as witnessed by their willingness to provide financial and in kind resources on a timely basis and in adequate amounts.

2) Progress being made on:

a) road survey work,
b) soils investigation for surfacing materials,
c) procurement of off-shore equipment,
d) procurement of off-shelf items, (e.g., hand tools, construction materials and a limited amount of equipment)
e) road construction work.

In examining progress in the above areas, achievements will be measured against the original implementation schedule attached to the Grant Agreement with the view of determining the impact achievement or nonachievement of these activities have on project implementation/success and the planned project completion date.

The PES will advance recommendations for any corrective action that is deemed necessary.

2. Special Evaluation

A special evaluation of this activity will be conducted at the end of the 24th month of implementation unless findings in the first PES (1. above) indicate that an immediate detailed assessment of the project is required. Since at this stage all key project activities should be underway a thorough, technically oriented evaluation will be timely at this point. The findings of this evaluation will serve as guidance for preparation of a proposed follow-on Phase II assistance effort to commence in FY 1981. The evaluation will consider the following:

a. Inputs (Host Government and USAID)

The evaluation will assess the timeliness and appropriateness of the project inputs with the view of determining their adequacy of achieving/not achieving project outputs. Assumptions at the input level will be examined as well in order to determine whether assumptions are occurring as planned. Specifically, at this level, the evaluation will review the findings and recommendations of the PES and examine the progress of project activities. Special emphasis will be placed on the availability of those commodities to be purchased off-shelf in Ethiopia (have they been purchased? are they in place?); continued GOE commitment to the project, etc.

b. Outputs

Assessment at the output level will review project progress against planned targets in all of the areas listed in the PES above. These items will be reviewed within the context of the project implementation plan and logical framework matrix. Causal factor affecting project implementation will be studied and critical assumptions at the output level will be reviewed.

c. Purpose/Goal

At this level, the evaluation will seek to verify the soundness of the project purpose and the fact that progress is being made and the goal will likely be achieved. In assessing progress toward achieving the project's purpose, the evaluation will measure progress toward end of project conditions. In addition, the evaluation will examine: the overall project setting; continued economic viability of the activity; the overall impact of any implementation delays; cost occurrences; and the entire design of the project.

d. Evaluation Team

The Mission with REDSO/EA inputs will prepare a detailed term of reference including the above mentioned areas of concern prior to selection of a team of evaluators. Current plans call for a joint evaluation including representatives from the EPMG, USAID and outside consultants (2) with expertise in low cost rural roads construction.

3. PES: at month 36.

4. Close-out evaluation.

D. Conditions Covenants and Negotiating Status

The design and concept of the project, as well as the content of the PP, have been thoroughly discussed with and concurred in by the ERA and the Planning Commission. Similarly, the substance of the proposed project Grant Agreement has been discussed with and concurred in (in principle) by representatives of the ERA. There are no outstanding significant issues.

It is not anticipated that the grant will be exceptional or otherwise justify a condition precedent (CP) to disbursement requiring submission of a legal opinion on the validity of the agreement.

In addition to the standard conditions precedent to disbursement and covenants, the agreement may include a CP requiring evidence of the existence of an operational Rural Roads Organization and a covenant to the effect that the GOE will utilize the equipment presently located with the governments of Gemu Gofa and Gojjam Provinces for rural road construction in connection with the project.

With regard to the Implementation Plan, language will be included in the Grant Agreement that the Implementation Plan, if it is not agreed to in final by the date of signing of the Agreement, will be finalized and agreed to not later than 60 days after the date of signing of the Grant Agreement.

ANNEX A

AID/W PRP APPROVAL MESSAGE

P 302044Z DEC 75
FM SECSTATE WASHDC
TO RTUABA/AMEMBASSY ADDIS ABABA PRIORITY
RUVQC/AMEMBASSY NAIROBI PRIORITY
BT
UNCLAS STATE 304536

AIDAC

E.O. 11652: N/A

TAGS:

SUBJECT: ETHIOPIA RURAL ROADS

1. THE ECPR REVIEWED THE SUBJECT PRP DECEMBER 15, 1975. IN REVIEW, THE ECPR NOTED THE NUMBER OF INDEPENDENT APPROACHES (PRP ANNEX A PAGE 4/5) TO PROVIDING LOW COST ROADS IN ETHIOPIA. IN DISCUSSING THOSE APPROACHES AND THAT PROPOSED BY THE CROWN AGENTS WITH RILEY, FIVE SEPARATE BUT INTERRELATED ISSUES WERE IDENTIFIED:

A) WHAT SORT OF GOVERNMENT INSITUTIONS SHOULD PRESIDE OVER THE PLANNING, FINANCING AND CONSTRUCTION OF LOW COST ROADS?

B) HOW SHOULD PERIODIC MAINTENANCE BE PROVIDED?

C) TO WHAT ENGINEERING STANDARDS SHOULD A PARTICULAR ROAD BE BUILT?

D) HOW SHOULD PROJECTS BE SELECTED AND PRIORITIES SET? AND

E) WHAT TECHNIQUES SHOULD BE EMPLOYED TO CONSTRUCT SUCH ROADS?

2. THE ECPR RECOGNIZED THAT THE POTENTIAL FOR DIFFERING APPROACHES TO THE ISSUES IS ENDLESS (AS EVIDENCED BY THE EXTENDED DISCUSSION WITH THE PROJECT COMMITTEE, ECPR AND WORLD BANK). THE ISSUES, OF COURSE, ARE INTERRELATED AND SHOULD BE CONSIDERED SIMILTANEOUSLY AND COMPREHENSIVELY IN THE PP. WHILE THE ECPR EXPECTS THE ISSUES TO BE GIVEN EXPLICIT SYSTEMATIC CONSIDERATION, IT FULLY APPRECIATES THE COMPLEXITY OF THE TASK. INSTITUTIONS, BUREAUCRACIES AND INTEREST GROUPS EXIST. TECHNIQUES AND WAYS OF DOING THINGS HAVE ALREADY DEVELOPED FOR GOOD REASONS AND BAD. THE ISSUES SPAN THE INTERESTS OF A NUMBER OF PROFESSIONS SUCH AS CIVIL ENGINEERING, ECONOMICS, REGIONAL PLANNING AND PUBLIC ADMINISTRATION. IN ADDITION, NO SMALL AMOUNT OF IDEOLOGY IS INVOLVED. IN THAT SENSE, THE PP MUST OF NECESSITY REPRESENT A REALISTIC ASSESSMENT OF THE POSSIBLE (P.E. COMPROMISE), BUT HOPEFULLY FOLLOWING A FULL AIRING OF THE ISSUES

AND FULL UNDERSTANDING OF THE IMPLICATIONS OF DECISIONS TAKEN. A SUMMARY OF PROJECT COMMITTEE/ECPR COMMENTS WITHIN EACH ISSUE CATEGORY IS SUMMARIZED IN AN AIRGRAM WHICH FOLLOWS. THE PRP WAS ALSO DISCUSSED AT THE WORLD BANK SUBSEQUENT TO THE ECPR MEETING. COMMENTS FROM THOSE DISCUSSIONS ARE INCLUDED IN THAT AIRGRAM.

3. THE PRP CONTEMPLATES INITIATION OF A NATIONAL RURAL ROADS PROGRAM IN ETHIOPIA INCLUDING THE ORGANIZATION, STAFFING, TRAINING AND EQUIPPING OF A RURAL ROADS ORGANIZATION. GIVEN THE COMPLEXITY OF THE DESIGN TASK, THE ECPR RECOMMENDED THAT CONSULTANTS BE IDENTIFIED (ECONOMIC/ENGINEERING) TO ASSIST THE MISSION/REDSO IN DEVELOPING A DESIGN PROGRAM/SCHEDULE AND ESTABLISHING SUBSTANTIVE POSITIONS ON THE ECONOMIC AND TECHNICAL ISSUES. THE CONSULTANTS WOULD REVIEW THE PRP AND CROWN AGENTS' REPORT; DISCUSS THE REPORT AND PROPOSED PROGRAM WITH THE GOE, USAID, REDSO AND IBRD; ASSIST THE MISSION IN DEVELOPING SUBSTANTIVE POSITIONS ON THE VARIOUS ISSUES; AND OUTLINE DESIGN REQUIREMENTS/ASSIGNMENTS (WHICH MAY ALSO REQUIRE CONSULTANT INPUTS). INITIALLY THE CONSULTANTS WOULD PRODUCE A TASK FLOW CHART FOR DESIGN RELATED TO AID'S TIME REQUIREMENTS AND NECESSARY AND RELATED ETHIOPIAN DECISIONS/INPUTS AND IBRD DECISIONS/INPUTS. ON THIS BASIS, THE DESIGN PROCESS CAN BE MANAGED/MONITORED (PERHAPS ADJUSTED FOLLOWING IDENTIFIED CHECK POINTS SUCH AS THE FEBRUARY/APRIL IBRD MISSIONS) AND IF SLIPPAGE IS TO OCCUR TO HAVE IT OCCUR IN A FRAMEWORK CLEARLY UNDERSTOOD BY THE GOE/IBRD AND PARTICIPATING DONORS. FOR EXAMPLE, SOME DESIGN WILL DEPEND UPON GOE DECISIONS WITH REGARD TO ORGANIZATION, AND DELAYS IN THOSE DECISIONS COULD DELAY SPECIFIC DESIGN/APPROVAL STEPS CALLED FOR IN THE DESIGN SCHEDULE.

4. THE ECPR RECOMMENDED THAT THE CONSULTANTS WORK OUT THE TASK FLOW IN ADDIS. AID/W ASSUMES THAT THE TWO IDENTIFIED DESIGN MANAGERS WOULD BE AVAILABLE THROUGHOUT THE DESIGN PERIOD ON A LIMITED OR CALL BASIS. CONSULTANT INPUTS REQUIRED WITHIN THE DESIGN COULD BE SELECTED ON THE BASIS OF SPECIFIC REQUIREMENTS AND WOULD NOT NECESSARILY HAVE TO COME FROM THE DESIGN MANAGERS' FIRM. IT IS ANTICIPATED THAT ASSISTANCE WILL BE REQUIRED INTER ALIA FOR EQUIPMENT INVENTORY/REQUIREMENTS ANALYSIS, TRAINING, ROAD MAINTENANCE ANALYSIS, EQUIPMENT MAINTENANCE ANALYSIS, ETC.

5. AID/W RECOMMENDS LOUIS BERGER, INC. TO ASSIST IN COMPLETING THE DESIGN PROGRAM.

A) ECONOMIST HAROLD P. KURZMAN

EDUCATION: BA, ECONOMICS, HAVERFORD; MA, ECONOMETRICS, JOHNS HOPKINS: PMD, MANAGEMENT, HARVARD GRADUATE SCHOOL OF BUSINESS ADMINISTRATION.

1973-1975: PROJECT MANAGER, LOUIS BERGER INTERNATIONAL, INC. UNDP/IBRD TURKEY TRANSPORTATION STUDY. RESPONSIBLE FOR THE ESTABLISHMENT OF BASIC TRANSPORTATION PLANNING PROCEDURES INCLUDING DEVELOPING OF: A MANAGEMENT INFORMATION SYSTEM, A TRANSPORT DEMAND FORECASTING MODEL, A TRANSPORT COST MODEL AND A SYSTEM FOR MONITORING TRANSPORT RELATED EXPENDITURES AND REVENUES FOR THE GOVERNMENT OF TURKEY. REVIEWED ALL MODES OF TRANSPORTATION AND ADVISED THE GOVERNMENT INVESTMENT PRIORITIES AND THE ORGANIZATION AND ADMINISTRATION OF ALL AGENCIES AND DEPARTMENTS IN THE TRANSPORT SECTOR.

SENIOR ASSOCIATE, LOUIS BERGER INTERNATIONAL, INC. ADVISOR TO PROGRAMME AND PROJECTS OFFICE NEDA AND THE PLANNING AND DEVELOPMENT DIVISION OF THE DEPARTMENT OF PUBLIC WORKS, TRANSPORT AND COMMUNICATIONS AND THE GOVERNMENT OF THE PHILIPPINES. PROVIDED ASSISTANCE IN IDENTIFYING AND FORMULATING PRIORITY PROJECTS FOR INTERNATIONAL FINANCING. SUPERVISED PROGRAM PLANNING AND DESIGN OF NATION-WIDE FEEDER ROAD PROGRAM. ESTABLISHED PLANNING PRIORITIES AND PROGRAM FOR IMPLEMENTATION. DEVELOPED STAFF AND MANPOWER TRAINING PROGRAMS AND SUPERVISED IMPLEMENTATION.

B) ENGINEER WILLIAM S. MATTHEY

EDUCATION: BS, CIVIL ENGINEERING, UNIVERSITY OF NEW HAMPSHIRE

1971-1975: PROJECT MANAGER, LOUIS BERGER INTERNATIONAL, INC., HIGHWAY ORGANIZATION, MAINTENANCE AND TECHNICAL ASSISTANCE PROGRAM FOR THE GOVERNMENT OF THE PHILIPPINES. SUPERVISED NATIONWIDE HIGHWAY DEVELOPMENT PROGRAM. SUPERVISED RURAL FARM-TO-MARKET ROAD CONSTRUCTION PROGRAM.

PROJECT MANAGER, IBRD/UNDP HAITI TRANSPORT SURVEY. PREPARED NATIONAL TRANSPORT PLAN FOR ALL MODES. REVIEWED OPERATIONS, BUDGETS, STAFFING AND ORGANIZATION OF ALL MODES OF TRANSPORTATION. REVIEWED LOCAL CONSTRUCTION INDUSTRY AND PREPARED NATIONWIDE FARM-TO-MARKET ROAD STUDIES.

6. CANDIDATES AVAILABLE EARLY JANUARY. ADVISE. IF ACCEPTABLE, WILL PROCEED UNDER IQC PROCEDURE.

7. TASK FLOW CHART SHOULD IDENTIFY DESIGN REQUIREMENTS/ ASSIGNMENTS, SCOPES WHERE OUTSIDE ASSISTANCE REQUIRED, RELATIONSHIP TO GOE DESIGN INPUTS/DECISIONS AND IBRD DESIGN INPUTS/DECISIONS. IN THIS SENSE CHART SHOULD INCORPORATE ELEMENTS PERT TO ENABLE USAID/REDSO EFFECTIVELY MANAGE/ MONITOR DESIGN. REQUEST MATERIAL BE SUBMITTED FOR AID/W REVIEW NOT LATER THAN JANUARY 31, 1975.

8. AS SUGGESTED EARLIER, BELIEVE TWO CONSULTANTS COULD USEFULLY SERVE THROUGHOUT DESIGN PERIOD IN ASSISTING AID BEFORE, DURING AND AFTER IBRD APPRAISALS DEFINE/ RESOLVE ISSUES AND REVISE TASK FLOW. HOWEVER, THIS QUESTION WILL BE ADDRESSED IN DEVELOPING DESIGN PROGRAM AND IS OPEN TO USAID/REDSO DISCUSSION WITH KURZMAN/ MATTHEY.

9. FINALLY, AFR DETERMINED MOVE SETTLEMENT DL FROM IQ TO 76 TO COINCIDE WITH DG SCHEDULE AND TO MOVE RURAL ROADS PROPOSAL FROM 76 TO IQ. THIS SHIFT GIVES ADDITIONAL TIME FOR DESIGN. WHILE TASK FLOW MAY BE DEFINED INITIALLY WITHIN THIS TIME FRAME, MISSION SHOULD BE AWARE DELAYS IN DESIGN OCCASSIONED BY GOE/IBRD OR AID COULD FORCE SLIPPAGE INTO 77. IF TASK FLOW CAREFULLY PREPARED WITH GOE, ANY QUESTION OF U.S. MOTIVATIONS SHOULD SLIPPAGE OCCUR WOULD BE MITIGATED. ROBINSON

AIRGRAM

DEPARTMENT OF STATE

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ATTACHMENT

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DATE REC'D.

JAN 21 1976

DATE SENT
1/9/76

FROM - AID/W

E.O. 11652: N/A

SUBJECT - Ethiopia Rural Roads PRP

REFERENCE - A. State 304530 B. Burns - Low Cost Road Construction in Developing Countries

1. The ECPR reviewed the subject PRP December 15, 1975. Additional steps to be taken as part of the design process were outlined in Ref A. The purpose of this airgram is to summarize Project Committee/ECPR/World Bank comments within each issue category:

a) What sort of government institutions should preside over the planning, financing and construction of low cost roads?

b) How should periodic maintenance be provided?

c) To what engineering standards should a particular road be built?

d) How should projects be selected and priorities set? and

e) What techniques should be employed to construct such roads?

2. In discussions at the World Bank subsequent to the ECPR meeting, a paper prepared by Robert E. Burns, formerly Infrastructure Advisor to the Government of Ethiopia with the Harvard Institute for International Development, was passed to AID officials (Ref B and attached). The issues raised by Mister Burns in his paper are the same as those raised by the Project Committee and ECPR, although the commentary on issues does not represent the official concerns of the AID committees. The Project Committee urges, nevertheless, that USAID/REDSO take cognizance of the paper, utilize the analysis where helpful during design and address the issues in the technical sections of the PP.

PAGE 1 OF PAGES 6

DRAFTED BY	OFFICE	PHONE NO.	DATE	APPROVED BY:
Hugh I. Smithwald	AFR/ESA	23508	12/30/75	AFR/ESA - Jerry Knoll

AID AND OTHER CLEARANCES
SER/ENGR:WGardner
AFR/DP:EDonoghue AFR/DS:GThompson GC/AFR:STisa
AFR/ESA:OCylke PPC/DPRE:RRobel

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3. Institutions

a) Control over primary road building programs has been an important source of power in many countries, and is usually centralized. This is because the money to finance the roads is raised by central institutions, because those at the center enjoy and desire power, and because a primary road building program can be managed intelligently and effectively from a single power center. However, experience with many types of centralized organizations has indicated that there is a limit to the size and complexity of a spatially distributed organization that can be controlled from a central location. Looking after the primary road network is a large responsibility that requires a variety of skills, expertise and equipment. Most countries have recognized that some form of decentralization is required for non-primary road construction and maintenance and devolve some power to lower administrative organizations to handle what they cannot handle at the center. The degree of real decentralization of a roads program is an enormously important factor governing the issues of maintenance, standards, project selection, techniques of construction and resource mobilization. PP design should take account of the decentralization issue and its relationship to the issues identified by the ECPR.

b) The ECPR acknowledged that the requirements for agricultural development and the recent disastrous drought highlight the need for much more than a primary road system in Ethiopia. Secondary roads of essentially provincial interest as well as feeder roads of interest at the awraja and wareda levels are clearly also required. The question arises as to the implications of this local focus of interest for organization. Beyond the proposed RRO/PRRO involvement in rural road construction and maintenance, are there opportunities to also work with peasant associations, cooperatives, local government, etc. in these activities? Since rural people and associations will participate in selecting the roads, are there ways for building their on-going participation/responsibility for road construction and maintenance? The ECPR believes the proposed project may offer significant opportunities for decentralization, participation and domestic resource mobilization.

c) The PRP assumes that the Provincial Committees will be representative of the Awrajas. Are there ways to assure that these Committees are indeed representative? Will the SPUs be representative?

d) The proposed loan contemplates the establishment of a new organization (RRO) instead of utilizing the Ethionian Highway Authority to deal with rural roads. Given the significance of this venture and the far reaching policy implications for other sectoral policy/program developments, the ECPR believes that USAID/REDSO should particularly give careful attention to the institutional requirements in the creation of a new, discrete rural roads organization. Paramount among these requirements are the staffing needs, training of personnel and equipping the organization. The ECPR is concerned about the adequacy of trained manpower to staff the new rural roads organization. The PRP suggests that some of the personnel from EHA, and other governmental and non-governmental entities involved in rural roads activities will be transferred to the new organization. The ECPR is concerned as to whether such arrangement will not weaken EHA's administrative and technical capacity. Furthermore, in regard

to the transfer of personnel from entities engaged in rural road activities, will the projects of such entities also be transferred to the new organization? If so, the PP should detail the projects that are to be assumed by the RRO, the priority accorded to these projects vis-a-vis the RRO's proposed undertakings and the technical and administrative capability of the RRO to assume such responsibilities at this early stage.

e) Concern was also expressed over coordination of recruitment and training by Province of sufficient manpower to supervise and operate equipment procured under the loan to assure availability of manpower at the time equipment is projected to be available in country to avoid extended down time on equipment. In view of the recognized manpower constraint associated with the substantial decentralized rural road program, the ECPR suggests that the PP should include a detailed training program, identifying personnel requirements in all aspects of the program.

f) The ECPR is concerned with the relationship of the proposed Rural Roads Project to USAID's MPP II and other development or social service programs of the Government. The Committee feels that provision be made to ensure that the roads constructed under this project are linked to those programs. In preparing the PP, the Committee recommends that the Mission examine the complementarity of goals and criteria for resource allocation among Government development and social programs that might be related to the rural roads program. There is concern that the activity might be regressive (or, at least, that benefits will not be maximized) in terms of rural development if other Government activities do not supplement the rural roads program or, at least, are not planned in full cognizance of the program.

4. Maintenance

The acid test of whether or not a feeder road program works is whether or not maintenance is conducted. Unfortunately, lack of maintenance has not been so much a problem to be solved as it is a fact of life with which engineers in Ethiopia live by refusing to build low standard access roads in the first place, and by building roads that are constructed to extremely high standards. The ECPR infers that it is this approach to access roads that has given rise to the Crown Agent's recommendation for a separate and new institution for rural road construction. One of the fundamental facts that hovers in the background of all engineering planning is the knowledge that all engineered construction begins to deteriorate the moment it is put in place. It is only a question of time. Thus, a very low standard road becomes impassable after one wet season. A higher standard road with some drainage structures might last for two or three seasons of neglect before the ditches silt up and the embankment washes away. So called "permanent" construction might last five years before becoming impassable. In a world of road building where the one-shot effort dominates and maintenance is not performed, there is a natural inclination to build something that will last five years before reconstruction is required (i.e. EHA approach). In a world of regular periodic maintenance, such standards are economic nonsense. In a world of deferred maintenance they make more sense but seriously limit the reach of the construction program and introduce strain to

economic choices. The Project Committee noted that the failure of maintenance programs is often exacerbated when a low standard, decentralized facility requiring much maintenance is constructed by a centralized organization. The central organization may be able to get the money, men and machines together one time and build the road; but providing money, men and machines for annual maintenance over the long haul is much more difficult and considerably less dramatic. The issue is then posed: is the organization of separate and new institution necessarily going to solve the maintenance problem. Clearly it will resolve the EIA approach to construction and maintenance; but will the new organization have the will, funds or capacity to undertake the maintenance task? The PP must address this issue. For example, who is or will be responsible for the inventory of rural roads already constructed? Will the new organization assume that responsibility? Immediately or at some later date? Perhaps somewhat facetiously, an IBRD project technician suggested quote, For the moment all we can say concerning the provision of basic rural access is that a functioning maintenance organization for low cost roads is so important that it is probably wise when considering a program to consider only maintenance at the outset. If such an organization can be set up and financed it is possible then to talk about new construction. If not, it is unfair to raise aspirations. end quote. Although the ECPR would not fully support this position, it does seem to pose the issue squarely: an optimum maintenance program and technique is not particularly useful without an implementation capability.

5. Standards

a) The issue was raised within the Agency and with the World Bank. While giving full credence to the PRPs argument that traffic flows as 10 ADT and lower can make the difference between development and stagnation when they carry the first fertilizer into an area, the first extension agents, the first medical teams, and carry out the first surplus crops to be marketed, the Committee is uncertain how the GOE proposes to get at the standards issue. While the classification at Page 12 of the PRP is helpful, the Committee assumes the bulk of the roads will fall initially to the RR10 standard either because traffic projections are impossible to determine or because the level of traffic is, in fact, at that minimal level. There is little experience with this standard road. Maintenance problems are compounded at this standard. All of the rules that have been so laboriously learned by builders of higher standards roads are put to question. The ECPR believes the PP must address current experience with roads to this standard(construction and maintenance) and the factors/justification for standards selection.

b) The ECPR suggests that the PP contain a complete analysis of the road standards proposed by the Crown Agents. Members of the ECPR expressed concern as to the appropriateness of the proposed road standards especially with regard to the adequacy of the RR0 type of roads suggested in the PRP. Therefore, the manner in which standards are determined/classified should be outlined in the PP, taking into consideration the trade off between alternative development strategies and common assumptions with regard to penetration roads (e.g. a change to livestock development in some areas which might not require the same road infrastructure as crops), trade-offs between construction standards and maintenance, trade-offs between construction standards and traffic projects and trade-offs between weather and on farm or regional storage.

c) The PRP indicates a wide range in construction costs per kilometer in previous rural road programs undertaken by USAID. Given the relatively low construction cost in the Food for Work program, is USAID considering utilizing such a program to complement the rural roads project?

6. Road Selection

a) While concurring that economic analysis for the proposed project would be difficult, the ECPR believes USAID/RFDSO should give immediate attention to the methodology to be employed. The Committee suggests that the analysis include resource allocation at the national budget level, balance within the transport sector, construction implications for recurrent requirements, national priorities in terms of regions/crops/populations etc., and local criteria for road selection/standards. Since the IBRD's 7th Transport Loan will be cast as a loan incorporating much of the analysis suggested above, it is strongly urged that economic methodology be closely coordinated with the IBRD.

b) The ECPR recommends that the project incorporate a process for feedback and evaluation of economic and technical experience within the rural roads program and with other rural road activities undertaken by different agencies. This is considered critically important given the weak analytic base and the opportunity to lay the basis for a continuing program.

c) The ECPR expressed concern that the PP contain sufficient analysis regarding engineering, technical and financial plans, and estimate of cost, to indicate Section 611(a) of the FAA is satisfied. Since the purpose of the project is development of institutional capability to construct and maintain roads, rather than construction of specific roads, the thrust of the analysis should relate to the extent of need for a network of rural roads, and the technical, economic and financial requirements of developing a capacity which can construct and maintain such a network. In general, such plans should include the identification of technical requirements, equipment, administrative, logistic, manpower (recruitment and training) and supervision required to achieve the objective, including a reasonably firm cost estimate of each element. It should identify technical and financial obstacles to the accomplishment of objectives and should describe the manner in which obstacles will be overcome.

d) Since the capability to construct is the purpose rather than construction of specific roads, analysis need not identify specific roads. On the other hand, A.I.D. does have an interest in the roads to be constructed to assure meeting of congressional mandates, relationship of roads with other assistance packages and maximizing impacts of roads. The PP should discuss in detail agreed criteria for selection of roads. There should be satisfactory technical and economic feasibility for roads estimated to cost more than the minimum amount (below which it would not be economically practical to conduct a study). An appropriate differentiation might be made on the basis of ADT standards. The methodology and minimum satisfactory results of such studies should be established in the PP.

e) The ECPR suggests that careful consideration be given to the economic impact of those roads selected for construction but do not have MPP inputs. The PRP makes the case that "it is in large part through the application of fertilizer, new seed and new

practices that the affected farm family begins to increase income. Since the national program will have to relate to MPP, crop specific programs such as coffee, settlement, and other social service programs, the PP should assess the level of complementarity between goals and criteria for resource allocation among Government programs. Different goals and programs could lead to rural road construction without prospect for the application of fertilizer, new seed or new practices. Members of the Project Committee recommended that formal coordination mechanisms with EPID be given careful consideration.

7. Construction Technique

a) The Project Committee suggested that the opportunities for intermediate technology be thoroughly explored as either part of project design or as an issue to be addressed by the new RRO, perhaps utilizing U.S. technical assistance. See Ref B.

b) The experience with R & R roads and Food for Work roads should be thoroughly examined and evaluated as part of the PP design.

c) The ECPR suggests that the technical analysis in the PP be sufficient so that equipment lists, utilization procedures, costs estimates, etc. can be finalized. In addition, it is suggested that USAID should come to an agreement with EIA and HERF on plans for maintenance and equipment.

d) The ECPR recognized that there will be a manpower constraint associated with the substantial decentralized rural road program contemplated in Ethiopia, and suggests that a detailed training program be developed, identifying personnel requirements in all aspects of the program. The level of analysis required needs be sufficient to justify the level of resources to be available in the loan for training.

8. Rehabilitation of existing rural roads are not provided for in the PRP. Thus, the ECPR recommends that analysis of requirements for these roads be included in the PP.

9. Guidance follows with regard to environmental impact.

Selection of Road

CC/AF also concerned that relationship between project and goals of food and nutrition funding category be clearly defined.

INGERSOLL

Attachments:
V/S

SEND TO: ADDIS ABABA, NAIROBI FOR REDSO

ANNEX B

TECHNICAL ANALYSIS

Technical Analysis

I. Introduction

The project has been described earlier in the paper. This section looks in detail at the specific requirements necessary for the project to meet its objectives.

The four types of roads to be included in the 5-year Rural Roads Program were described in Chapter II*.

All potential rural road alignments in all the above described groups may be new construction or may be essentially rehabilitation of an existing unmaintained road. Equipment and manpower requirements for new construction differ from those required for rehabilitation (and needs for rehabilitation itself will vary). The construction units proposed herein are organized with the needed flexibility to meet both types of requirements.

The Rural Roads Organization will take over construction and maintenance responsibilities of all Group II through IV rural roads (and delimited amounts of assistance in construction and maintenance of Group I roads that are constructed to the minimum RRO standard) as soon as it has developed the management capability to do so. It is anticipated that the RRO will absorb the equipment and personnel of the MPP I and II programs (road construction component) and of the Relief and Rehabilitation Commission.

Roads in Groups II and III that are receiving separate AID funding or will in future receive soil funding are not considered in the proposed project for funding, except that it is presently assumed that the MPP II Program in Gemu Gofa and Gojjam will utilize the roads being constructed in this project.

The concept of very low cost roads place highway engineers in a different world in which they are generally uncomfortable. All the rules that they have been taught during their careers must be discarded. Engineering drawing, quantity estimates and contract specifications may not be applicable as the cost of their preparation might exceed the cost of the road itself. Some engineers may not wish to be associated with such fragile roads where higher risks of deterioration are permissable and several washouts per year are often acceptable.

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* I Self-Help, II Relief & Rehabilitation, III EPID MPP II, IV Crown Agents.

The conceptual approach to this program of construction and maintenance planning should be "practicability through flexibility". The program herein is intended to be a model from which construction and maintenance methodologies can be extended to other provinces. An estimated ninety (90%) percent of Group IV type rural roads constructed under this project will be rehabilitation of existing (nearly impassable) tracks. Such rehabilitation work requires a more mobile, lighter unit than would new construction.

II. Proposed Rural Roads Project

The project provides technical and training assistance to the central Rural Roads Organization located in Addis Ababa and technical and training assistance to the provincial offices as they develop; construction and maintenance equipment; hand tools; repair parts; partial recurrent and labor cost for the construction and maintenance of Rural Roads in Gemu Gofa and Gojjam Provinces.

The project consists of the following six components financed in part by the AID Grant:

A. Technical Expertise

The Technical Assistance will consist of providing three technicians in the field of: (1) construction, rehabilitation and maintenance of rural roads, (2) equipment maintenance and operations, and (3) procurement, warehousing and supply management. The first two would be provided for three years each and the third for 9 months. These technicians will provide assistance to both the central and provincial Rural Roads Organizations in organizing, planning and implementation of the Five Year Rural Roads Program.

B. Training Expertise and Training Programs

Training assistance will consist of providing four technicians to assist the central and provincial RRO in setting up and implementing the required training courses, both in the Provinces and at the Alemgena Training Center. This assistance is supportive of the IDA financed program. There will be one full time trainer in rural road methodology and these short time trainers in the fields of technical writing, rural road supervisors and cost accounting. The training assistance will also include short term (3-6) months participant training for 18 construction superintendents and longer (12-18 months) programs in road construction and maintenance management for 4 road engineers.

C. Procurement of Commodities

The project will finance the foreign exchange component of construction and maintenance equipment; shop tools and equipment; hand tools; engineering equipment and supplies; repair parts; tires; training materials and supplies; and construction materials required to implement the first phase of the five-year Rural Roads Program in the central organization and the provincial organizations in Gemu Gofa and Gojjam Provinces.

D. Road Construction

The project will finance the construction of approximately 336 kilometers of rural roads in Gemu Gofa Province and 290 kilometers in Gojjam Province. The roads proposed for inclusion in this project are listed below:

Priority	Location	Length Kms.
Gemu Gofa Province		(336.0)
1	Arba Minch/Gidole Rd.-Felege Neway	167.0
2	Arba Minch/Sodo Rd.-Chencha	25.0
3	Arba Minch/Gidole Rd.-Sidamo Province Border	50.0
4	Turmi-Murle	60.0
5	Jinka-Mago Park Headquarters (Total Length of Road is 45.0 kms.)	34.0
Gojjam Province		(290.0)
1	Wetet Abay-Daghi	17.0
2	Debra Markos-Erob Gebeya	40.0
3	Minase Kola-Berekt	25.0
4	Erob Gebeya-Mota	65.0
5	Bichena-Shebel	25.0
6	Bulched-Yejube	35.0
7	Fagita-Dangla/Fafa	25.0
8	Moto/Bichena Rd. - Mertole Mariam	25.0
9	Chazni-Debate-Debre Zeyt (Total Length of Rd. is 105 kms)	33.0

E. Road Maintenance

The project will finance the maintenance of rural roads in Gemu Gofa Province starting with 55 kilometers in year one and rising to 370 kilometers in year three. This will increase to 734 kilometers by the end of the five

year program. The project will finance the maintenance of rural roads in Gojjam Province starting with 102 kilometers in year one and rising to 307 kilometers in year three. This will increase to 551 kilometers by the end of the five year program.

F. Construction of Provincial Offices and Construction Camps

The project will finance a portion of the construction costs of offices, equipment, workshops and warehouses for the provincial headquarters in Gemu Gofa and Gojjam Provinces, and construction camps for the various road construction projects.

III. Engineering Requirements

A. Proposed Rural Roads Organization

1. General

The new organization set up to handle the rural roads program will be organized and staffed taking into account:

a. The 10-year program of rural road construction and maintenance as outlined in the Crown Agents report of 1976.

b. The total equipment, workshops, materials, labor and cost of the 10-year program.

c. The appropriate relationship between the central and provincial offices.

d. The decentralization of the rural roads organization as much as possible to the provincial level.

e. The appropriate method of financing the rural roads program and organization.

f. The appropriate system of audits, checks and evaluation.

2. Existing Organization

The present organization for rural roads is a division within the Ethiopian Roads Authority (Rural Roads Division) which is responsible for the construction of only a minority of rural roads now under construction. The greater majority of rural roads are still the responsibility of individual development projects.

The rural roads projects now under construction are being administered from the central headquarters with some assistance provided by the ERA at district shop level. (There are 9 such shops). There is no provincial headquarters organization in effect at this time in any of the fourteen provinces.

3. Proposed Rural Roads Organization (RRO)

The Rural Roads Organization as submitted to the council of ministers for approval will be a semi-autonomous organization under the Ethiopian Roads Authority. The Rural Roads Organization (RRO) as proposed will consist of the following:

a. Central Headquarters Organization

The Central Headquarters Organization will control and coordinate the activities of the fourteen provinces and will consist of the following:

i) Central Rural Roads Committee

The Central Rural Roads Committee will consist of at least five members appointed by the Planning Commission from representatives of several different agencies preferably those involved in the Rural Roads Task Force (RRTF) set up by the Planning Commission in 1973 to study the Rural Roads Program. The Director the RRO would act as chairman of the committee. The duties of the committee are to review the works program submitted by the provincial committees; advise the General Manager, ERA and the Director, RRO on all matters concerning rural roads; insure that views and intensions of government departments, international donor agencies and other interested bodies are made known at the central level; and to advise the government on the allocation of its financial resources between the fourteen provinces for rural roads.

ii) Director

The Director will be a senior civil engineer who will be responsible for the overall supervision and coordination of the fourteen provincial rural roads organizations. He will report to the Board of Commissioners through the General Manager, ERA and will manage the central organization and act as Chairman of the Central Rural Roads Committee.

iii) Administrative Division

The Administrative Division will be formed in the central headquarters as a staff function and consist of a skeletal framework of branches to deal with personnel, finance and supply matters. The responsibility of the Administrative Division is to maintain liaison with the

Highways side of ERA, which will be providing support services to the RRO, and to coordinate with their respective branches in the provinces.

There is some reservation within the present Rural Roads Division as to whether or not the Highways administrative division would be responsive to the needs of the RRO and this may be a point well taken. However, it is felt that with proper policy guidelines set downn by the General Manager, ERA, this problem can be minimized with support being provided to the RRO equal to that being received by Highways. In any event, if after a trial period, this is not successful, it will be recommended that the RRO Administrative Division be staffed in accordance with the staffing pattern outlined in the five year highway sector program for rural roads. An evaluation of this arrangement should be undertaken in year 2 of the project.

iv) Technical Service Division

The Technical Service Division will be formed in the Central Headquarters as a staff function and will consist of a skeletal framework of branches to deal with equipment, survey and design, self-help schemes, evaluations, research and inventory. The responsibility of the TSD is to maintain liaison with the Highways division providing services and to coordinate their respective branches in the fourteen provinces. It is recommended that the TSD functions be formed at the provincial level as soon as possible to avoid a large build up in the central office staffing.

b. Provincial Rural Roads Organization

A Provincial Rural Roads Organization will, over the course of the program, be established in each of the fourteen provinces. It will be headed by a provincial rural roads engineer (or a very skilled and experienced supervisor) who will be responsible to the Director, RRO for all the activities of the RRO in his province. Each PRRO will be located in the capital city of the Administrative Region. The PRRO will be self-contained to the greatest possible extent. A typical Provincial Rural Roads Organization as proposed will consist of the following:

i) Provincial Rural Roads Committee

The Provincial Rural Roads Committee will consist of representatives from the Provincial and Awraja administrations, Development Agencies, Peasant Associations, the Highways Organization and the Provincial Rural Roads Engineer acting as secretary of the Committee. The PRRC will assist the PRRO in drawing up road priorities, preparation of the annual works program and translating the people's needs for roads

into the provincial rural roads program.

ii) Provincial Rural Roads Engineer

The PRRE will be a civil engineer who will be responsible for the overall supervision of the Provincial Rural Roads Office. He will report directly to the RRO, Director on all activities of the Rural Roads Office in his province. The PRRE will be located at the Provincial Rural Roads Headquarters which includes offices for staff and workshop facilities. He will supervise the administrative, equipment and works branches.

iii) Administrative Branch

The Administrative Branch consists of sections to deal with personnel, finance, supplies and general administrative matters. The responsibility of the Administrative Branch is to maintain personnel records, pay accounts of projects, administrative functions of the projects, purchase and issue of materials and repair parts.

iv) Equipment Branch

The Equipment Branch will consist of an equipment maintenance and repair shop to repair and maintain all the equipment assigned to the headquarters staff, construction units, augmentation unit and maintenance units of the province. The PRRO will jointly utilize the ERA Highway Equipment Repair Facilities (HERF) where they are located in the same town (as in Debre Markos). This joint utilization will include mechanical support of equipment and storage, issue and accountability of spare parts and materials for the rural roads program in the province.

v) Works Branch

The Works Branch consists of sections to deal with survey and design, self-help schemes, construction of roads, maintenance of roads and maintaining the equipment augmentation unit. It will manage and control each of the above units under its supervision. It will evaluate their work, materials used and construction methods. Each of these units are very important and will be discussed in separate section of their own.

(a) Survey and Design Unit

The Survey and Design Unit is responsible for route survey and selection, design of projects, location of material pits and for staking out the selected centerline of construction projects.

(b) Self-Help Schemes Unit

The Self-Help Schemes Unit will be responsible for providing assistance to Peasants Associations desiring to build self-help roads. It will provide assistance to the Peasants Associations in route selection, surveying, construction of road-bed and drainage structures. It may provide equipment and materials such as cement, reinforcing steel and explosives to self-help roads projects when they are required and can be made available.

(c) Construction Unit

Each province will have one or more light construction units headed by a construction engineer or superintendent who is responsible to the Provincial Engineer for all activities of his unit. The productivity of one construction unit under normal conditions will be able to construct 60 to 80 kilometers of new roads or to rehabilitate 120 kilometers of rural roads per year. The personnel and equipment requirements for one construction unit have been altered from the Crown Agents and Five Year Highway Program recommendations to consist of basic equipment that can be equally split into two construction components capable of operating at separate sites where light construction requirements exist. The heavy or costly equipment units will be maintained as headquarters back-up equipment that can augment any construction or maintenance project. This will eliminate the chances of building up excess stocks of costly equipment when more than one construction or maintenance unit is required in a province.

(d) Maintenance Unit

Each province will have one or more Maintenance Units headed by a Maintenance Superintendent who is responsible to the Provincial Rural Roads Engineer for all activities of his unit. The productivity of one Maintenance Unit under normal conditions will be to maintain 600 kms. of roads per year. The Maintenance Units can be equally split into two crews capable of operating at separate sites where light maintenance requirements exist.

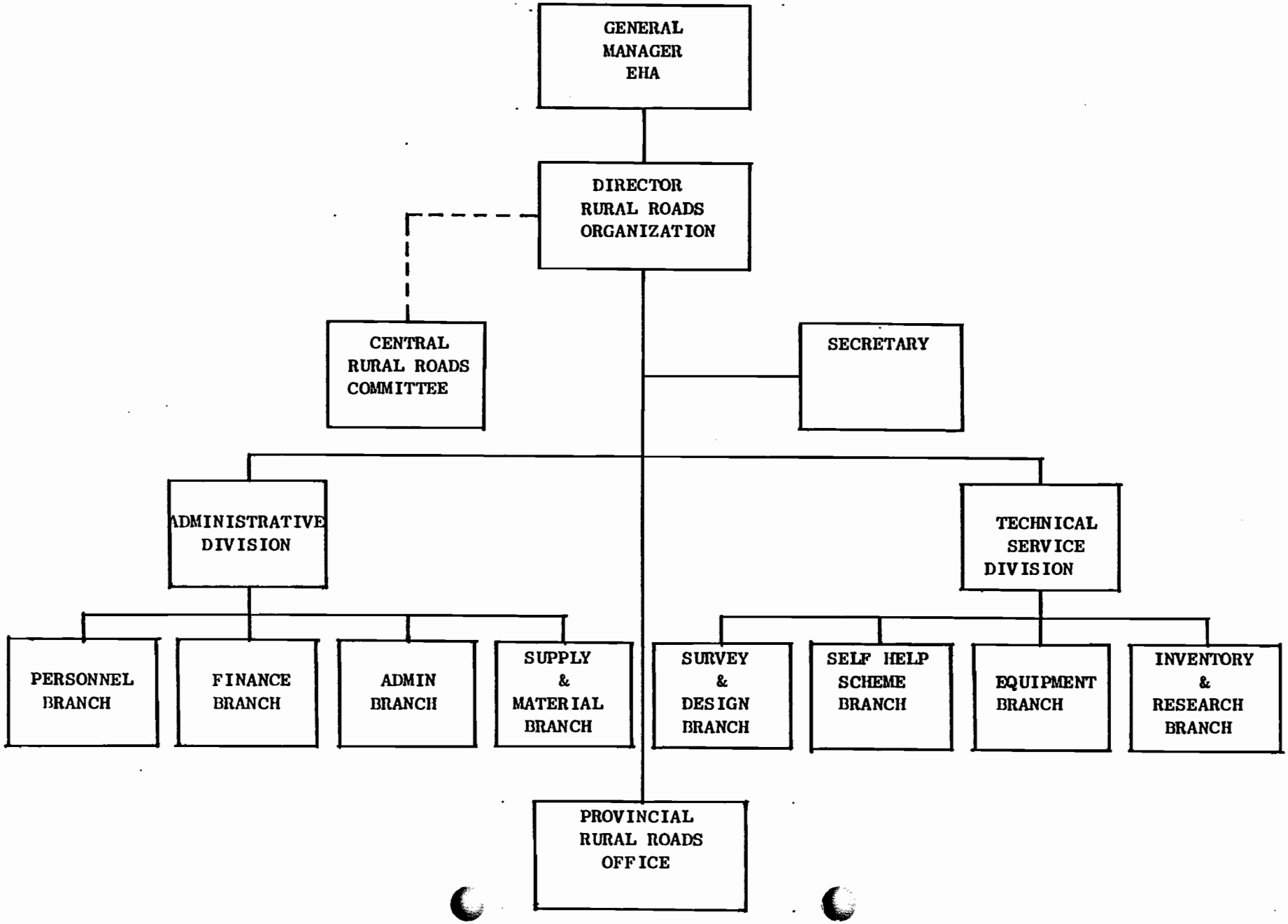
(e) Augmentation Unit

Each province will have one Augmentation Unit. This unit will consist of heavy or costly equipment that is not required on every construction or maintenance project but is necessary for the total construction and maintenance program in each province. It will provide transport between projects, specialized equipment and additional units and manpower as warranted by difficult new construction, rehabilitation or heavy maintenance.

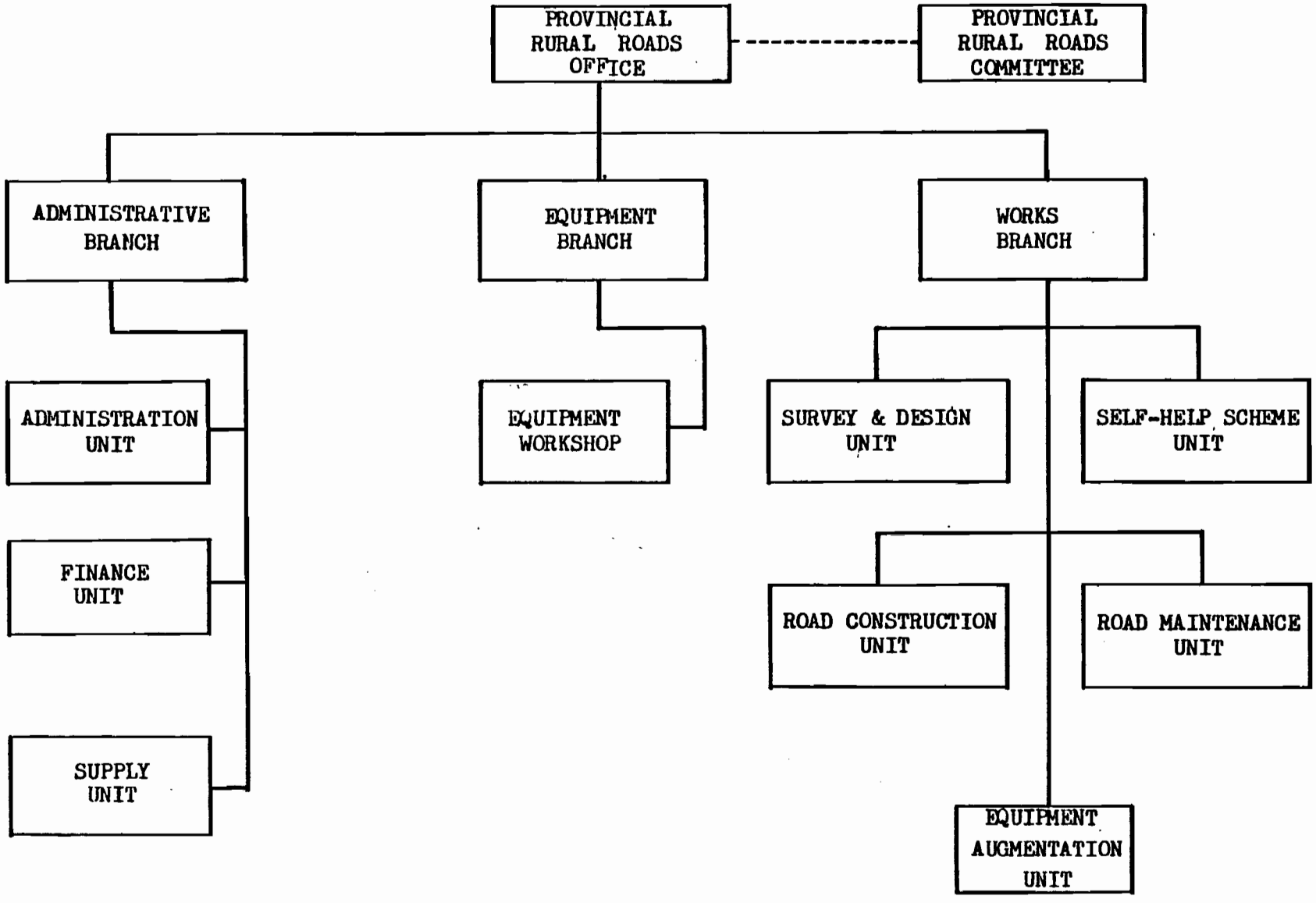
Establishing a decentralized Rural Roads Organization will not be accomplished very rapidly and a relatively high degree of centralized control at its inception will be necessary during the initial stages of the rural roads program until sufficient personnel are trained and capable of managing the program at the provincial level. This central control, however, should be maintained at a minimum level consistent with good management practices for the magnitude of the rural roads program during the first 5-7 years.

In following the above rationale, the Rural Roads Organization would be decentralized, with a central office serving a staff function constituted to determine general policy guidance, maintain liaison with the ERA supporting functions and to accomplish centralized procurement, but with actual planning and implementation of the rural roads program being controlled at the provincial level. The Provincial Rural Roads Engineer should be one grade higher in authority status than the Division Heads in the Central Office in order to give greater assurance of central staff responsiveness to field requests and provide incentives for senior engineers to work in the provinces. Moreover, the PRRE will have line responsibility for supervision of substantial numbers of staff, equipment and expenditures and will participate as executive secretary for meetings of the PRRCs when road matters are discussed. (See attached charts.)

CENTRAL HEADQUARTERS ORGANIZATION



TYPICAL PROVINCE HEADQUARTERS



4. Staffing Requirements of the RRO

a. Central Headquarters Organization

The staffing requirements for the Central Headquarters Office presented in the Crown Agents and the Highway Sector Program Report include personnel for a complete autonomous operation of the RRO, but dependent on many of the services of the Highways Organization. This staffing of the RRO will require a new Rural Roads Organization Office building to house some of the 294 employees. The remaining personnel will be assigned to supplement the engineering support facilities and the equipment, spare parts and material warehousing of the Highways Organization required to support the rural roads activity.

The central organization staffing will be 174 personnel in Year One, 265 in Year Two and a maximum of 294 in Year Three. Guidelines will be worked out between the new Rural Roads Organization and the Highway Organization regarding the sharing of central headquarters technical support services. These guidelines will be approved and enforced by the General Manager of the Ethiopian Road Authority. The Rural Roads Director will periodically prepare a work program indicating his technical support requirements for a specific period in advance and present these to the various Highways division supervisors so that the latter can staff and budget to meet these anticipated requirements. The EHA support divisions will then be held accountable for prompt execution of the services required by the RRO.

b. Provincial Rural Roads Organization

The staffing proposed herein for the PRRO is sufficient for the management of one light construction and one light maintenance unit. In the event of the requirement of a second unit of either type, an increase in office and mechanical staff will be required to augment the headquarters staff. This increase in office and shop personnel would be approximately 25 percent for one additional light construction unit and 10 percent for one additional light maintenance unit.

c. Rural Roads Construction Unit

The personnel requirements for one light construction unit have been altered from the recommendations of the Crown Agents and Rural Roads Sector Program report. A light construction unit consists of 165 skilled and 600 unskilled personnel.

d. Rural Roads Maintenance Unit

The personnel for the maintenance units are the same as recommended in the Rural Roads Sector Program. On the average, for each 600-700 kilometers of rural roads a maintenance unit is required. A maintenance unit consists of 41 skilled and 200 unskilled personnel for a total of 241. During the program period 19 maintenance units will start operating according to the schedule below:

E.F.Y.	Administrative Region
1970	Wollo, Shewa, Sidamo and Harrarghe Provinces
1971	Gemu Gofa, Bale and Gojjam Provinces
1972	Bale, Keffa and Wollo Provinces
1973	Begemider, Illubabor, Wollega and Tigrai Provinces
1974	Sidamo, Gemu Gofa, Harrarghe, Shewa and Eritrea Provinces

5. Equipment Requirements of RRO

The equipment requirements are based on (a) equipment usage in the present on-going rural roads projects in Ethiopia, (b) the recommendations of the Crown Agents report on rural roads, (c) the Louis Berger International, Inc. report on rural roads and (d) the ERA 5 year Rural Roads Program.

All the above reports and activities recommend a combination of labor intensive methods with the minimum amount of equipment required to insure the construction and maintenance of good quality rural roads.

This project will provide the following equipment for Rural Roads construction:

a. Equipment Summary

This project will provide 170 pieces of construction and maintenance equipment plus communications, survey and workshop tools and equipment for the provinces of Gemu Gofa and Gojjam. It is estimated that this equipment will cost $3,781,400 at present day prices. It will require approximately one year to procure the equipment; therefore an escalation factor of 7 percent is added to the estimated equipment cost. A 10 percent contingency factor is included to provide for unexpected escalation or equipment requirements. (See Table 1 in Attachment A to this Annex.)

EQUIPMENT SUMMARY

GEMU GOFA AND GOJAM PROVINCES*

EQUIPMENT

Equipment Description	No. Units	Unit Cost	Total Cost
1. Tractor, Crawler, 180 hp	6	105,000	630,000
2. Motorgrader, 125 hp	10	55,000	550,000
3. Tractor, Farm, 75 hp, 4x4	20	15,000	300,000
4. Trailer, Hydraulic Tipping, 4 cm	32	4,500	144,000
5. Frontend Loader, 1½ cy	2	58,000	116,000
6. Roller, S.W., S.P., 8-10 T	2	33,000	66,000
7. Roller, S.W., Towed	4	4,200	16,800
8. Trailer, Fuel, 750 g., Tlr. Mtd.	6	5,000	30,000
9. Trailer, Water, 750 g., Tlr. Mtd.	6	5,000	30,000
10. Crusher, 15 tph	2	75,000	150,000
11. Crusher, 5 tph	2	50,000	100,000
12, Concrete Mixer	4	3,000	12,000
13. Air Compressor w/Tools, 365 cfm	2	36,000	72,000
14. Welder, 300 amp, Tlr. Mtd.	2	8,500	17,000
15. Truck, Pickup, 3/4 T, 4x4	14	9,000	126,000
16. Suburban, 4x4	8	9,000	72,000
17. Shop Crane, 10 T, Mobile	2	15,000	30,000
18. Truck, Flatbed, 5-7 T	6	24,000	144,000
19. Truck, Flatbed, 10 T	2	35,300	70,600
20. Truck, Dump, 5 cm., 4x2	12	31,000	372,000
21. Truck, Water, 2000 g., 4x2	2	42,400	84,800
22. Truck, Fuel, 2000 g., 4x2	2	42,400	84,800
23. Truck Tractor w/50 T Lowbed Tlr.	2	107,000	214,000
24. Generator, 15 kva	4	12,100	48,400
25. Tank, Fuel, 5000 g., stationary	4	2,500	10,000
26. Water Pump, Stationary	4	500	2,000
27. Water Pump, 60 gpm, Tlr. Mtd.	6	1,500	9,000
28. Grease Unit, Tlr. Mtd.	2	13,500	27,000
29. Radio, Mobile, SSB, 100W	4	1,500	6,000
30. Radio, Base, SSB, 100W	2	2,000	4,000
31. Mechanic Tool Sets	10	500	5,000
32. Survey Equipment Sets	10	2,000	20,000
33. Camp Workshop Tools and Equipment	4	5,000	20,000
34. Province Workshop Tools & Equipment	2	99,000	198,000

Total Project Equipment Cost May 1977	3,781,400
Inflation at 7 percent for one year	264,700
Total Equipment Cost and Inflation	4,046,100
Contingency at 10 percent	404,600
Total Equipment Cost	4,450,700

* Shown Again as Table 1 of Attachment 1.

b. Provincial Headquarters and Workshop

This project will provide 6 Landrover Suburban 4 wheel type vehicles for the Provincial Headquarters Office and Workshop. It will provide all the necessary tools and equipment for the provincial workshops in Gemu Gofa and Gojjam Provinces. It is estimated that this equipment will cost $176,000 for each of the two provinces. (See Table 2 in Attachment 1 of this Annex.)

c. Equipment Augmentation Unit

The augmentation unit in each province will include the large equipment required for heavy construction and transportation units. It will include a truck tractor with 50 ton lowbed trailer for transporting equipment, crushers for concrete material and aggregate surfacing, air compressors for blasting rock, and dump trucks for hauling surfacing material long distances. This unit will provide the construction and maintenance units with heavy equipment on demand. The project will provide 24 units of heavy equipment for each of the two provinces of Gemu Gofa and Gojjam. It is estimated that this equipment will cost $872,000 at present day prices. (See Table 3 in Attachment 1 of this Annex.)

d. Light Construction Unit

The light construction unit in each province will consist of 36 pieces of construction equipment plus communications, survey and workshop tools and equipment. The unit can be split into two equal units that can be utilized at two different locations in the same area when very light construction is required. It will work as a consolidated unit when heavier construction requires it. It will be able to construct from 115 kilometers in flat terrain to 24 kilometers in difficult mountainous terrain of RRO standard roads annually. It is estimated that the equipment will cost $592,600 at present day prices. (See Table 4 in Attachment 1 of this Annex.)

e. Maintenance Unit

The Maintenance Unit in each province consists of 18 pieces of maintenance equipment plus mechanic tool sets. The unit is designed to maintain from 100 to 704 kilometers of rural roads annually. Since there will not be enough roads constructed to RRO standards during the first two years of the project to fully utilize these units to their maximum capacity they will be used to help bring roads that were constructed originally to RRO standard back up to these standards. There are many roads in the provinces which have been allowed to deteriorate to such a low standard that they are impassable in some cases. There is no lack of roads that require

maintenance of some kind. During the third year of the project, it is expected that this unit will be fully utilized on roads constructed under the rural roads standards. This unit can be broken into two separate maintenance crews for light work. It is estimated that the maintenance equipment will cost $249,500 for each province at present day prices. (See Table 5 in Attachment 1.)

f. Hand Tools

The project is designed to utilize labor intensive construction methods to the maximum extent possible. This requires a large number of hand tools that can be utilized by the hand labor. Most of these tools can be purchased on the local economy and will be utilized by both the construction and maintenance units. It is estimated that the cost of these hand tools will be $35,450 for each unit at present day prices. It is also estimated that 25 percent of the tools will be either lost, broken or stolen and will have to be replaced in the second and third year. In addition an equal amount of hand tools will be purchased for distribution to Peasants Associations for self-help road construction. (See Table 6 in Attachment 1.)

6. Facility Requirements of the RRO

a. Central Headquarters Office

The new Rural Roads Organization will require the construction of a headquarters building located in Addis Ababa to house approximately 294 people. This headquarters building is being designed and funded by the Ethiopian Road Authority. It is estimated to cost approximately $250,000 including all necessary furniture and office equipment.

b. Provincial Headquarters Office

The establishment of a provincial rural roads office in each of the 14 provinces will eventually require the construction of a new provincial office building and workshops. In the early stages of the project, the RRO will utilize existing Highways Organization and development agencies facilities in some of the provinces.

In reviewing the Crown Agents report and the plans developed by the ERA for the Provincial Headquarters site and building layout plans, it appears that the shop space and possibly the office space is too small for providing the necessary field support to the construction and maintenance units. Also many functions have been omitted from these plans such as: machine shop, tire repair shop, electrical and battery shop, welding shop, blacksmith shop, wood working shop and heavy duty shop. Also office space for the construction and maintenance engineers and the self-help scheme

unit have been omitted. The Berger team and USAID have recommended an amended layout to ERA which includes these omitted items, it has been accepted in principal by ERA.

The Provincial Headquarters cost for the revised plan is estimated to be $150,000 with $100,000 of this amount for the workshops and $50,000 to erect the offices. This price includes the required furniture and office equipment. This project includes the construction of the Provincial Headquarters in Gojjam and Gemu Gofa Provinces. The estimated cost of these two facilities is $300,000. For a sketch of the recommended province facilities. (See Attachment 2 of this Annex.)

c. Construction Camps

The five-year Rural Roads Program includes the construction or rehabilitation of 6,348 kilometers of rural roads. It is estimated that a construction camp will be required for each 35 kilometers of rural roads constructed. The five-year program will require the construction of some 181 camps (42 at 100 percent cost and 139 at 50 percent). The estimated cost of a construction camp is $36,600 each or a total cost of $4,080,900 for the national five-year program.

The five-year construction program in Gemu Gofa Province consists of the construction or rehabilitation of approximately 560 kilometers of rural roads. This will require the construction of approximately 16 camps. This requires 3 new camps which are 50 percent reusable for remaining 13 camps at a total cost of $374,700. Since this project covers only three years of the five-year program or approximately 336 kilometers of roads, it requires the construction of 10 camps at a total cost of $237,900.

The five-year construction program in Gojjam Province consists of the construction of approximately 482 kilometers of rural roads. This will require the construction of approximately 14 camps at a total cost of $311,100. Since this project covers only three years of the five-year program or approximately 290 kilometers of roads, it requires the construction of nine camps at a total cost of $219,600.

d. Maintenance Camps

The maintenance units will not require a permanent type camp and the cost of constructing their temporary camps is included in the cost of the maintenance unit.

e. Summary of Facility Requirements

This project includes the construction of Provincial Headquarters Offices and Workshops in Gemu Gofa and Gojjam Province. It also includes the construction of seven construction camps in Gemu Gofa Province and six in Gojjam Province. The total cost of facilities funded under this project is:

Central Headquarter, Addis Ababa	250,000
Provincial Headquarters Gemu Gofa, 1 each	150,000
Provincial Headquarters Gojjam, 1 each	150,000
Construction Camps in Gemu Gofa Province	(237,900)
Arba Minch/Sodo Rd.-Chencha, 1 @ $36,600	36,600
Arba Minch/Gidole Rd.-Felege Neway 2 @ $36,000 & 2 @ $18,300	109,800
Arba Minch/Konso Rd.-Sidamo Border, 2 @ $18,300	36,600
Turmi-Murle, 2 @ $18,300	36,600
Jinka-Mago Park Headquarters, 1 @ $18,300	18,300
Construction Camps in Gojjam Province	(219,600)
Wetet Abay-Daghi, 1 @ $36,000	36,600
Debre Markos-Erob Gebeya, 1 @ $36,600	36,600
Minase Kola-Bereket, 1 @ $36,600	36,600
Erob Gebeya-Mota, 1 @ $18,300	18,300
Bichena-Shebel, 1 @ $18,300	18,300
Bulched-Yejube, 1 @ $18,300	18,300
Fegita-Dangie/Fafa, 1 @ $18,300	18,300
Mota/Bechena Rd.-Mertole Mariam, 1 @ $18,300	18,300
Chazni-Debata-Debre Zeyt, 1 @ $18,300	18,300
Total Facility Cost	$1,007,500

7. Non-Personal and Material and Supply Requirements of PRRO

a. Provincial Headquarters Office

The non-personal expenses of the Provincial Headquarters is estimated at 15 percent of the personnel expenditure. These expenses are estimated as follows:

Year One	$426,096 x 0.15	$ 63,916
Year Two	468,706 x 0.15	70,306
Year Three	511,316 x 0.15	76,698
	Total	$210,920

b. Construction Unit

The non-personnel expenses of the Construction Unit are estimated at 15 percent of the personnel expenditure. These expenses are estimated as follows:

Year One	$660,600 x 0.15	$ 99,090
Year Two	726,660 x 0.15	108,999
Year Three	792,720 x 0.15	118,908
	Total	$326,997

The material cost of the construction camps are broken down into the following categories:

Fencing		1,200
Barbed Wire	800	
Wood Post	400	
Well Drilling Casing		10,000
Buildings		20,400
Wood and Lumber	6,120	
Corrugated Iron	10,200	
Cement	4,080	
Electrical Wiring and Poles		3,000
Wiring & Fixtures	2,000	
Wood Poles	1,000	
Furniture		1,000
Misc. Camp Cost		1,000
	Total	$ 36,600

The materials required for the actual construction of the roads are broken down as follows:

Pipe Culverts - rural roads construction requires approximately one culvert per five kilometers of roadway. They are usually from .5 to 1 meter in diameter. There are 626 kms of roads to be constructed in Gojjam and Gemu Gofa Provinces in the first three years of the project. This gives 125 culverts, eight meters in length, for a total requirement of 1,000 linear meters. The average cost will be $20.00 per meter for a total of $20,000.

Rock Fords - rural roads construction requires approximately one rock ford per km of roadway. They will be six meters wide and approximately 15 meters long. There are 626 kms of roads to be constructed in

Gojjam and Gemu Gofa Provinces in the first three years of the project. This gives 626 rock fords. It requires approximately 25 bags (50 kgs.) of cement per rock ford. This gives 626 rock fords at 25 bags per ford for a total requirement of 15,650 bags of cement. At $3.00 per bag the cost will be $46,950.

Concrete Bridges - rural roads construction requires a small bridge approximately every 25 kilometers. The average bridge will be six meters wide and 7 meters long. Each bridge will require approximately 50 cubic meters of concrete and three tons of reinforcing steel. There are 626 kms of roads to be constructed in Gojjam and Gemu Gofa Provinces in the first three years of the project. This will require 25 small bridges to cross small streams that run year round and cannot be forded. At seven bags of cement per cubic meter of concrete the project will require 87 bags of cement and 75 tons reinforcing steel for small bridges. At $3.00 per bag of cement and $550 per ton of reinforcing steel this comes to a total cost of $26,250 for cement and $37,500 for reinforcing steel.

Explosives - rural roads construction requires explosive for rock excavation. It is estimated that it will require 100 lbs per km or 62,600 lbs of explosives at $1.10 per pound. This makes the cost of explosives for the 626 kms of road cost $68,860.

Oxygen & Accetylene - it is expected that the construction projects will require approximately $13,000 worth of this material for repairing equipment and tools per year. This comes to $43,200 for three years of construction work.

Food - the construction units will provide one kilogram of flour to unskilled employees of the construction crew.

Each construction unit has 440 unskilled employees to whom food will be provided.

Year One	$ 36,131
Year Two	37,860
Year Three	40,564
Total	$114,555

c. Maintenance Unit

The non-personnel expenses of the Maintenance Units is estimated at 15 percent of the personnel expenditure. These expenses are estimated as follows:

Year One	$177,936 x 0.15	$ 26,690
Year Two	195,730 x 0.15	29,360
Year Three	213,524 x 0.15	32,028
	Total	$ 88,078

d. Summary of Materials and Supplies

Materials and supplies are broken down into two categories called construction materials and other materials and supplies. The above costs are broken down into the cost codes as maintained by the Ethiopian Road Authority.

i) Construction Materials

Item	Year One	Year Two	Year Three	Total
Cement	46,854	36,648	40,697	$124,199
Structural Reinforcing Steel	12,500	13,750	15,000	41,250
Pipes and Culverts	5,994	6,660	7,348	20,002
Corrugated Iron	61,200	30,600	35,700	127,500
Wood and Lumber	36,720	18,360	21,420	76,500
Explosives	20,867	22,953	25,040	68,860
Oxygen & Acetylene	13,000	14,400	15,800	43,200
Electrical Supplies	18,000	9,000	10,500	37,500
Well Casing	60,000	30,000	35,000	125,000
Fencing Barbed Wire	7,200	3,600	4,200	15,000
Other Construction Materials & Supplies	6,000	3,000	3,500	12,500
Total	288,335	188,971	214,205	691,511

ii) Other Materials and Supplies

Item	Year One	Year Two	Year Three	Total
Office Supplies	49,828	54,810	59,794	164,432
Janitorial Supplies	4,530	4,983	5,436	14,949
Food	36,131	37,860	40,564	114,555
Chemicals, Medical & Lab.	4,490	4,939	5,388	14,817
Clothing & Linen Supply	6,787	7,466	8,146	22,399
Small Tools & Apparatus	70,900	17,726	17,726	106,352
Repairs & Maintenance of Materials & Supplies	11,604	12,764	13,924	38,292
Unclassified	8,585	9,440	10,298	28,323
Total	192,855	149,988	161,276	504,119

iii) Contractual Services

Item	Year One	Year Two	Year Three	Total
Communications	15,000	16,500	18,000	49,500
Machine & Equipment Charges	2,000	2,200	2,400	6,600
Freight & Storage	5,000	5,500	6,000	16,500
Postage	5,000	5,500	6,000	16,500
Travel	6,000	6,600	7,200	19,800
Building & Improvement Service	1,000	1,100	1,200	3,300
Utilities	20,000	22,000	24,000	66,000
Reproduction	10,000	11,000	12,000	33,000
Injury & Medical Expenses	30,000	33,000	36,000	99,000
Rental of Equipment, Land & Structure	3,000	3,300	3,600	9,900
Total	97,000	106,700	116,400	320,100

iv) Other Charges

Item	Year One	Year Two	Year Three	Total
Claims, Settlements & Court	1,000	1,100	1,200	3,300
General Insurance	5,000	5,500	6,000	16,500
Bank Service Charges	2,000	2,200	2,400	6,600
Interest Payments	1,628	1,792	1,955	5,375
General Administrative Expenses	10,000	11,000	12,000	33,000
	19,628	21,592	23,555	64,775

Note: All items in the four categories above are part of the non-personnel cost unless specifically itemized in the cost breakdown. Amounts are estimated from data provided by the GOE/ERA/RRD.

B. Rural Roads Standards

1. Discussion of Design Standards

a. General

The general standard which have been set by the Crown Agents are satisfactory, except for the following comments.

b. Typical Cross Section

It is the intent of this program to use as much labor as possible. Labor can excavate, load, and spread, but it cannot carry earth any distance efficiently. For all side hill construction earth removal can be minimized or eliminated altogether by moving the cross section into the hill in order that the earth work be limited to excavation only. As hill sides tend to be irregular and roadway alignments follow smooth geometric patterns this goal cannot be totally achieved; however, it should be followed wherever possible.

c. Rehabilitation of Existing Roads

It is the intent of this program to retain the horizontal and vertical geometry of the existing goods, even accepting the occasional violation of RR-10 criteria.

There is some fear that the tendency of highway engineers to want to flatten the occasional too steep grade and too sharp curve will lead to higher costs. The tendency of many highway engineers is to build as good as highway as possible.

A "creeping improvement" will set in and soon entire new alignments, built to higher standards will be constructed at much higher cost. This must be avoided by periodic inspection from central headquarters complete with admonitions to keep within the authorized standards.

d. Compaction

Current rural road construction practices places very little emphasis on compaction and this is considered a major factor in loss of road-bed due to frequency of washouts, loss of rideability and loss of camber. The Berger consultants strongly recommended that on the USAID-assisted projects, greater attention be paid to compaction of both subgrade and surface course.

A dearth of surface water supply was noted by the consultant east of Felege Neway, as well as the southern and the western portions of Gemu Gofa Province. A 1,000 gallon water trailer is included in each construction unit to haul water for soil moisture control. The practical haul distance for such units is about 6 kilometers. Additionally, two flat bed trucks, upon each of which locally fabricated (at the provincial workshop). 1,000 gallon water tanks can be installed, are provided in the provincial augmentation equipment unit. The practical haul distance for such units is 15 kilometers. Where water must be hauled a greater distance, it will be more economical to accept compaction deficiencies (and resulting higher maintenance costs) and/or to schedule earth work to coincide with the rainy seasons.

e. Pavement Structure

One of the main shortcomings of the "Old Italian Roads" is unacceptable surfacing through areas of poor quality natural soils. On the other hand, where the in-site soils are of high quality and if routine maintenance has been provided, the riding surface would have been acceptable.

The Berger consultant concluded that the most rational proposal would be to supply surfacing in the poor soil areas to bring the entire roadway up to a minimum standard. A cut off point of a soaked CBR equal to 20% was selected. All natural soils have a bearing value below this would be improved with a surfacing material having a higher bearing value.

Based upon the consultant's visual inspection potential surfacing is available within the maximum haul distance of 10 kilometers (round trip).

f. Stream Crossings

All steams crossed by the consultant throughout the alignments designated for "rehabilitation" above can be forded during the dry season. The consultant frequently was obligated to improve crossings during the survey by moving rocks and/or pulling one vehicle through with another. It is proposed that trafficability be improved by constructing concrete framed, rock lined, fords, as per ERA standards.

Such fords can be upgraded to cross pipes, culverts or bridges as part of future stage construction depending upon traffic volumes.

The Berger consultant concurred with the bridge loading criteria proposed by the Crown Agents.

2. Design Standards Recommended

The rural roads constructed under the 5-year Rural Roads Program will be constructed to RR10, RR30 or RR50. (The roads constructed under the AID project will be almost entirely of RR10 standard). The three classes of rural roads recommended by the Crown Agents and adopted by the Rural Roads Division of ERA are classified as follows:

a. Road Class RR10

This road is constructed to minimum standards capable of carrying up to 10 vehicles per day during dry weather and closed to traffic during periods of heavy rain. Construction standards are as follows:

i) Right of Way Width

A minimum of 30 meters is considered desirable to permit future up grading.

ii) Cleared Width

The ROW will be cleared and grubbed to a width of 15 to 20 meters depending on the type of section and sight distances required.

iii) Road Bed Foundation Width

The roadbed width will be 6 meters from shoulder to shoulder.

iv) Pavement

Imported gravel or similar surfacing is not normally provided, but may be necessary over sections of steep gradient or where soils are particularly poor.

v) Maximum Gradient

14 percent grade.

vi) Horizontal Curvature

Minimum 10 meter radius.

vii) Drainage

Longitudinal drains normally cut by hand or occasionally by machine. Cross drainage structures to be of simpliest nature, simple stone fords where required.

viii) Bridges

Not normally provided but where essential, would generally be of timber deck on masonary piers and abutments.

b. Road Class RR30

This road is constructed to minimum standards capable of carrying up to 30 vehicles per day during dry weather and provides limited wet-weather capacity for light vehicles. Construction standards are as follows:

i) Right of Way Width

A minimum of 30 meters is considered desirable to permit future upgrading.

ii) Cleared ROW Width

The ROW will be cleared and grubbed to a width of 15 to 20 meters depending on the type of section and sight distance required.

iii) Road Bed Foundation Width

The road bed width will be 6 meters from shoulder to shoulder.

iv) Pavement

The riding surface will normally consist of in-situ subgrade material strengthened in areas of weak local soils and steep gradients by a layer of selected material over the full 6 meter roadbed. In areas of black cotton soil or clays with a CBR less than 20 a 150 mm thickness of gravel or crushed stone surfacing will be applied to the center 3.5 meters of the roadbed.

v) Maximum Gradient

12 percent.

vi) Horizontal Curvature

Minimum 15 meter radius.

vii) Drainage

Longtidunal drains normally cut by hand or occasionally by machine. Cross drainage to be by means of pipe culverts or simple stone fords where required.

viii) Bridges

Bridges may be provided at non-fordable streams or rivers. The cost of a substantial bridge structure should be weighed against the acceptability of a possible temporary interruption of traffic. If bridges are required, the abutments and piers should be of masonry with a minimum top width of 6 meters. The roadway width should have a minimum width of 4 meters. For clear spans of less than 7 meters timber beams and cross decking with running boards and/or diagonal planking should be used. For clear spans of over 7 meters the superstructure should be of steel or reinforced concrete. The design loading will be AASHTO H20-44.

c. Road Class RR50

This is an all-weather gravel surfaced road. This road is constructed to minimum standards capable of carrying up to 50 vehicles per day at all times of the year. Construction standards are as follows:

i) Right of Way Width

Minimum of 30 meters.

ii) Cleared ROW Width

The ROW will be cleared and grubbed to a width of 15 to 20 meters depending on the type of section and sight distances required.

iii) Road Bed Foundation Width

The road bed width will be 6 meters from shoulder to shoulder.

iv) Pavement

The road bed will normally be provided with a riding surface of gravel or crushed rock with a thickness of 150 mm over the full

6 meter road bed. In areas of poor natural subgrade material, a sub-base course of imported select material may be required over the full road bed of 6 meters.

v) Maximum Gradient

12 percent.

vi) Horizontal Curvature

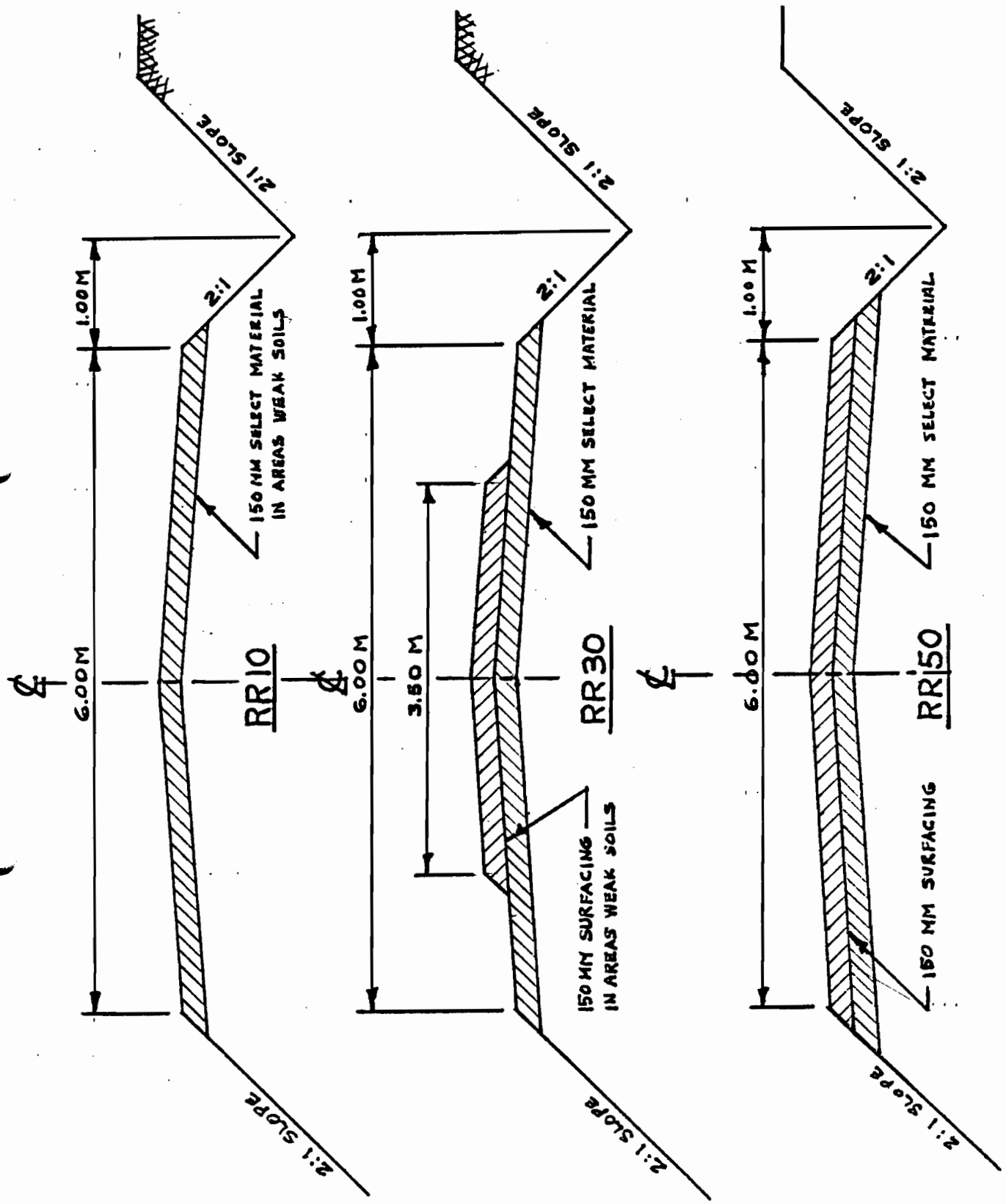
Minimum 15 meter radius.

vii) Drainage

Longitudinal drains normally cut by hand or occasionally by machine. Cross drainage will be by means of pipe culverts.

viii) Bridges

Bridges will be provided at non-fordable streams or rivers. The bridges will have masonry abutments and piers with a minimum top width of 6 meters. The roadway width will have a minimum width of 4 meters. For clear spans of less than 7 meters timber beams and cross decking with running boards and/or diagonal planking should be used. For clear spans of over 7 meters the superstructure should be of steel or reinforced concrete. The design loading will be AASHTO H20-44.



TYPICAL ROAD SECTION

C. Field Investigation and Recommendations

1. Road Segments Surveyed

Gemu Gofa Province

a.	Arba Minch/Sode Rd.-Chencha	25.0 kms
b.	Arba Minch/Gidole Rd.-Gerese-Kamba-Felege Neway	167.0 kms
c.	Sodo/Felege Neway Rd.-Jinka	67.0 kms
d.	Jinka-Key Afer-Dimeka-Baber-Konso-Arba Minch	334.0 kms
e.	Jinka-Hanna	80.0 kms
f.	Arba Minch/Gidole Rd.-Sidamo Province Border	50.0 kms
	Total	783.0 kms

Gojjam Province

a.	Bulched-Yechibe	35.0 kms
b.	Dembecha-Feres Bet	61.0 kms
c.	Debre Markos-Erob Gebeya	40.0 kms
d.	Yehula-Elias	22.0 kms
e.	Tilili-Gishe Abay-Sekela	50.0 kms
f.	Wetet Abay-Daghi	17.0 kms
g.	Wetet Abay-Ismala Giorgis-Kunzila	55.0 kms
h.	Wetet Abay/Ismala Giorgis Rd.-Aesebe	12.0 kms
i.	Minase Kola-Berekt1	20.0 kms
j.	Bichena-Shebel	25.0 kms
	Total	337.0 kms

Bale Province

a.	Dodola-Serofta-Nansibo	75.0 kms
	Total	75.0 kms

Sidamo Province

a.	Sodo/Arba Minch Rd.-Bedessa-Awasa/Wendo Rd.	94.0 kms
	Total	94.0 kms

2. Road Alignments Proposed

Gemu Gofa Province

a. Arba Minch/Gidole Rd.-Junction Jinka Rd. 167.0 kms

i) Arba Minch/Gidole Rd.-Gerese 38.5 kms

(a) Flat 7.0 kms
0+000 - 7+000 = 7.0 kms
(b) Rolling 13.0 kms
7+000 - 14+000 = 7.0 kms
10+000 - 26+000 =6.0 kms
(c) Mountainous 18.5 kms
14+000 - 20+000 = 6.0 kms
26+000 - 38+500 = 12.5 kms

ii) Gerese-Kamba 56.4 kms

(a) Flat 6.0 kms
80+000 - 86+000 = 6.0 kms
(b) Rolling 7.9 kms
75+000 - 80+000 = 5.0 kms
92+000 - 94+900 = 2.0 kms
(c) Mountainous 42.5 kms
38+500 - 75+000 = 36.5 kms
86+000 - 92+000 = 6.0 kms

iii) Kamba-Junction Jinka Rd. 41.8 kms

(a) Flat 12.7 kms
107+000 - 117+000 = 10.0 kms
134+000 - 136+700 = 2.7 kms
(b) Rolling 24.1 kms
94+900 - 107+000 = 12.1 kms
117+000 - 128+000= 11.0 kms
133+000 - 134+000= 1.0 kms
(c) Mountainous 5.0 kms
128+000 - 133+000 = 5.0 kms

iv) Junction Jinka Rd-Felege Neway 30.3 kms

(a) Flat 16.3 kms
136+700 - 143+000 = 6.3 kms
157+000 - 167+000 = 10.0 kms
(b) Rolling 4.3 kms
143+000 - 145+600 = 2.6 kms
149+300 - 151+000 = 1.7 kms
(c) Mountainous 9.7 kms
145+600 - 149+300 = 3.7 kms
151+000 - 157+000 = 6.0 kms

b. Arba Minch/Sodo Rd.-Chencha 25.0 kms

i) Flat 9.9 kms
0+000 - 6+000 = 6.0 kms
17+500 - 21+400 = 3.9 kms
ii) Rolling 3.6 kms
21+400 - 25+000 = 3.6 kms
iii) Mountainous 11.5 kms
6+000 - 17+500 = 11.5 kms

c. Arba Minch/Konso Rd.-Sidamo Province Border 50.0 kms

i) Arba Minch/Gidole Rd.-Gumaydo 19.0 kms

(a) Flat 3.5 kms
0+000 - 3+500 = 3.5 kms
(b) Rolling 15.5 kms
3+500 - 19+000 = 15.5 kms

ii) Gumaydo-Sidamo Province Border 31.0 kms

(a) Flat 7.0 kms
29+000 - 36+000 = 7.0 kms
(b) Rolling 20.0 kms
19+000 - 29+000 = 10.0 kms
36+000 - 38+000 = 2.0 kms
42+000 - 50+000 = 8.0 kms
(c) Mountainous 4.0 kms
38+000 - 42+000 = 4.0 kms

d. Turmi-Murle 60.0 kms

i) Flat 16.0 kms
44+000 - 60+000 = 16.0 kms
ii) Rolling 44.0 kms
0+000 - 44+000 = 44.0 kms

e. Jinka-Mago Park Headquarters 34.0 kms

i) Flat 19.0 kms
15+000 - 34+000 = 19.0 kms
ii) Rolling 15.0 kms
0+000 - 15+000 = 15.0 kms

Gojjam Province

a. Wetet Abay- Daghi 17.0 kms

i) Flat 12.0 kms
0+000 - 12+000 = 12.0 kms
ii) Rolling 5.0 kms
12+000 - 17+000 = 5.0 kms

b. Debre Markos-Erob Gebeya 40.0 kms

i) Flat 6.0 kms
0+000 - 6+000 = 6.0 kms
ii) Rolling 34.0 kms
6+000 - 40+000 = 34.0 kms

c. Minase Kola-Berekt 25.0 kms

i) Flat 8.0 kms
0+000 - 8+000 = 8.4 kms
ii) Rolling 17.0 kms
8+000 - 25+000 = 17.0 kms

d. Erob Gebeya-Mota 65.0 kms

i) Flat 14.3 kms
85+200 - 97+000 = 11.9 kms
98+000 - 100+500 = 2.5 kms
ii) Rolling 38.2 kms
40+000 - 54+500 = 14.5 kms
67+000 - 85+200 = 18.2 kms
97+000 - 98+000 = 1.0 kms
iii) Mountainous 12.5 kms
54+500 - 67+000 = 12.5 kms

e. Bichena-Shebel 25.0 kms

i) Rolling 25.0 kms
0+000 - 25+000 = 25.0 kms

f. Bulched-Yejube 35.0 kms

i) Rolling 35.0 kms
0+000 - 35+000 = 35.0 kms

g. Fagita-Dangia/Fafa 25.0 kms

i) Flat 18.0 kms
0+000 - 18+000 = 18.0 kms

ii) Rolling 7.0 kms
18+000 - 25+000 = 7.0 kms

h. Moto/Bichena Rd.-Mertole Mariam 25.0 kms

i) Rolling 25.0 kms
0+000 - 25+000 = 25.0 kms

i. Chazni-Debate-Debre Zeyt 33.0 kms

i) Flat 16.0 kms
0+000 - 10+000 = 10.0 kms
15+000 - 21+000 = 6.0 kms
ii) Rolling 17.0 kms
10+000 - 15+000 = 5.0 kms
21+000 - 33+000 = 12.0 kms

3. Site Reconnaissance

a. Conditions Affecting Construction Costs

The consultant's on site inspection identified four (4) primary "conditions" which would cause significantly higher construction expenses than normally encountered. There are:

i) Restricted Construction Season

The length of the construction season is directly related to the length and intensity of the rainy season. In highland areas where rainfall is very intense the construction season is only eight months. In lowland areas of meager rainfall construction can be carried out on a year-round basis. An average construction season of 10 months per year was used herein.

ii) Terrain

There is a direct relationship between the terrain and construction costs. The more rugged the terrain the higher the cost of construction.

iii) Rock Excavation

Excavation of rock by means of dynamite greatly increases costs. Fortunately nearly all rock observed by the consultant is rippable using a large bulldozer. Excavation of such rock is approximately 25% more expensive than ordinary earth excavation.

iv) Black Cotton Soil

This frequently encountered soil exhibites high swelling potential and strength loss during the rain season.

b. "Old Italian Roads"

During the consultant's on-site inspection, it was found that for the most part, roads dating back to the late 1930's connect the population centers shown in the Crown Agent's reports.

These alignments were constructed to geometric standards which are generally within acceptable rural roads criteria. Drainage control was (and is) minimal. Surfacing consisted of natural on-site materials, which fortunately were of high quality throughout much of the alignments.

Unfortunately, these roads have received only emergency type maintenance and have fallen into a very advanced state of disrepair.

4. Soils and Materials Investigations

a. Soils

i) Scope & Purpose

Soils investigations will be needed:

(a) Along the centerline.

(b) For potential borrow materials.

(c) For structure foundations.

A sample soils investigation report prepared by the Materials and Research Branch has been reviewed and it can be concluded that the Ethiopian Government has adequate capability for the needed investigations.

ii) Black Cotton Soils

Trafficability over this soil is very limited. This "condition" requires special investigation and construction procedures.

Typical engineering coefficients for the soil are:

Classification	A-7-5
CBR, 4 days soaked	2
Swelling, 4 days soaked	2 to 5%

Typical problems associated with such soils are:

(a) Loss of bearing value during rainy season.

(b) Swelling movements, and swelling pressures mobilized beneath surfacings.

Such soils are frequently found in valleys and lowland areas.

b. Appropriate Construction Materials

i) Specifications

Attached are recommended "goal" type specifications which are not to be treated as hard-and-fast construction specifications; but rather as a standard toward which the on-site personnel should aim.

If materials and construction methods comply with the suggested specifications the best rideability and minimum maintenance will be achieved. However, it is desirable to minimize capital cost, even at the expense of higher maintenance. Consistent with this concept, surfacing materials which can be obtained within a 10 kilometer round-trip haul should be utilized even if such materials do not exactly comply with the specifications.

ii) Materials Investigations

Prior to the start of construction the material and research department should be requested to conduct a materials survey.

The initial step should be a review of geologic maps followed by a field survey and laboratory testing program. Quantities consistent with needs within a maximum 10 kilometers round trip haul distance should be found.

The consultant's visual inspection of the projected roads indicated that materials within the above general requirements are readily available.

iii) Potential Surfacing Materials

(a) General

High quality potential surfacing materials are generally available within a 10 km round trip haul distance along all the potential road ways. Where the alignment actually falls within such formations, borrow select materials, will not be needed. All earthen embankments and select materials need to be compacted.

At present ERA road building methodology does not include compaction. Special emphasis during project monitoring must be placed on changing this methodology.

In general all black cotton soils and all clay soils having a soaked CBR less than 20 are to be surfaced with selected materials obtained from:

(1) Roadway excavation.

(2) Borrow excavation.

(b) Volcanic Ash

Volcanic ash is the most commonly utilized select surfacing material on rural roads.

It is anticipated that this custom will continue. This material typically yields a soaked CBR of 50 to 65 percent. Good compaction results have been obtained using pneumatic rollers.

Oversized rock is now being washed and it is anticipated that it will be most economical to continue this practice. However, use of grid rollers will be effective in breaking down oversized cinders which should yield an in-place surface with a stronger, more "boney", gradation.

(c) Sandstone, Quartzites & Schists

Where alignments pass through, or adjacent to Pre-Cambrian geologic formation, it can be anticipated that these rock types will be prevalent, and will yield high quality select fill surfacing. It can be anticipated that abrasion of construction equipment (including ruppers) will break down the soft, weathered-rock formations to acceptable gradation. As above, use of grid rollers will be effective in breaking down oversized rock.

(d) Rocky Clay

Adjacent to the base of hills composed of recent volcanics frequently is found a deposit of rocky tallus mixed with transported clays. By means of selective borrowing, suitable select fill surfacing can be obtained.

As the project is to be labor intensive, if water is readily available, the yield of a borrow pit can be substantially increased if a manual sluicing operation is set up to wash out excess plastic fines.

(e) Tuff Rock

Within recent volcanics formations there are numerous exposed pockets of tuff rock. Often the upper crust can be ripped loose. Further abrasion by excavating, transporting, placing and compacting equipment should break this rock down to acceptable select material surfacing gradation.

(f) Crushed Rock

Along most alignments, pit run materials from one of the above described sources should exist within the target haul distance. However, in case materials prove to be of unacceptable quality, a contingency crusher plant is included in the program in order to provide flexibility of construction planning.

(g) Soil-Cement

Within Gemu Gofa Province time was available only for an in-the-air observation of the Omo River flood plains. For prospective roads terminating in the Hanna and Murle vicinity, there may be a shortage of select material. If the on-site soils possess sufficient granular content they may prove to be satisfactory surfacing with compaction. On the other hand, it may prove necessary to mix a stabilizing agent, such as cement, with the soil to provide a suitable surfacing. It is anticipated that cement and water can be incorporated into the soil with hand tools and compacted with the equipment listed herein.

5. Ongoing Rural Roads Construction Projects

Province	Project	Length (km)	Rural Roads Standards	Project Cost (Birr)
Bale	Ginir-Imi	170	RR30	3,400,000
	Goba-Goro-Ginir	50	RR50	1,000,000
	Imi-Elkere/Gode	250	RR30	5,000,000
	Dodola Nansebo	100	RR30	2,440,000
	Robe-Agarfa	25	RR30	500,000
Gemu Gofa	Arba Minch-Konso-Jinka	225	RR30	4,500,000
	Waito-Erboro-Turmi-Kelem	250	RR30	5,000,000
Sidamo	Filtu-Dolo	240	RR50	4,800,000
	Negele-Wachile-Mega	240	RR30	4,800,000
Wello	Dessie-Kabe-Worilu-Jama & Korem Sekota	207	RR50	4,140,000
Tigrai	Adwa-Sekota & Abi Adi Mekele	329	RR10	6,580,000
Keffa	Gilgel Give-Omonada	17	RR30	340,000
	Jimma-Sheki/Sentema	50	RR50	1,000,000
Gojjam	Bahar Dar-Adet (part of main proposed)	45	RR30	900,000
	Dembecha-Feresbet	61	RR30	1,220,000
	Durbete-Ismala G.Kunzula	71	RR30	1,420,000
Hararghe	Adele-Grawa-Burka	122	RR30/50	2,440,000
	Harar-Combolcha-Fugnanbira	75	RR30/50	1,500,000
Shewa	Mukaturi-Alemketema	105	RR50	2,100,000
	Shome-Durami-Durgie	78	RR50	1,560,000
	TOTAL	2,710		54,640,000

6. Rural Roads Construction Schedule in Km (RRC)
EFY 1969 - 1974

Province		Length Km.	Standard	Project Cost (Birr)	1969	1970	1971	1972	1973	1974
	a. Ongoing Projects									
Bale	Ginir-Imi	170	RR30	3,400,000	35	40	40			
	Goba-Goro-Ginir	140	RR50	2,100,000	35	37				
	Imi-Elkere/Gode	250	RR30	5,000,000	30	50	70	70	21	
Gemu Gofa	Arba Minch-Konso-Jinka	225	RR30	4,500,000	45	50	53			
	Waito-Erboro-Turmi-Kelem	250	RR30	5,000,000	10	50	50	70	70	
Sidamo	Filtu-Dolo	240	RR50	4,800,000	80					
	Negele-Wachile-Mega	240	RR30	4,800,000	30	70	41			
Wello	Dessie-Kabe-Wereilu-Jama & Koren-Sekota	207	RR50	4,140,000	40	80	80	7		
Tigrai	Adwa-Sekota & Abi-Adi Mekele	329	RR30	6,580,000	30	50	70	70	70	19
	Total Ongoing	2,051		40,320,000	335	427	404	217	161	19
	b. New Projects									
Wello	Kabe-Makane Selame Tenta	185	RR50	3,700,000		50	70	65		
Tigrai	Finarawa-Samre-Mekele	100	RR10	2,000,000						70
Harrarghe	Babile-Fik-Hamer-Imi (after Filtu Dolo)	340	RR30/10	6,800,000		60	70	70	70	70
	Gode-Kelafo-Mustahil (after Imi-Elkere/Gode	240	RR30/10	4,080,000		—	—	—	40	70
	Total New Projects	865		16,580,000		110	140	135	110	210
	Grand Total	2,916		56,900,000	335	537	544	352	271	229

7. Rural Roads Construction Schedule in Km (EPID)
EFY 1969 - 1974

Province		Length Km.	Standard	Project Cost (Birr)	1969	1970	1971	1972	1973	1974
	A. Ongoing Projects									
Keffa	Gilgel Give-Omenada	17	RR30	340,000	17					
	Jimma-Sheki/Sentema	50	RR50	1,000,000	32	15				
Gojjam	Bahar Dar-Adet	45	RR30	900,000	20	20	5			
	Dembecha-Feresbet	61	RR30	1,220,000	30	31				
	Durbete-Ismala G. Kunsla	71	RR30	1,420,000	30	22				
Hararghe	Adele-Grawa-Burka	122	RR30/50	2,440,000	25	36	40			
	Harrar-Combolcha-Fugnanbira	75	RR30/50	1,500,000	20	30	21			
Shewa	Mukaturi-Alem Ketema	105	RR50	2,100,000	15	30	30	30		
	Shone-Durame-Durgi	78	RR50	1,560,000	20	30	28			
	TOTAL ONGOING	624		12,480,000	209	214	124	30		
	B. New Projects*									
Keffa	Gilgel Gibe-Dimtu	12		240,000		12				
	Jimma/Addis Rd.-Fofa	35		700,000			35			
	Diri-Gimbo-Bonga	25		500,000				25		
	Limu Genet-Limu Seka	15		300,000					15	
	Limu-Seka-Atnago	19		380,000						19
Gojjam	Jiga-Quarit	30		600,000			30			
	Jilili-Sekela	50		1,000,000				25	25	
	Bichena-Kuya	30		600,000						30

* Rural Roads Standards of these projects will be determined later.

Province		Length Km.	Standard	Project Cost (Birr)	1969	1970	1971	1972	1973	1974
	B. New Projects (Continued)									
Hararghe	Grawa-Meyumuluke	80		1,600,000				30	30	20
	Zigita-Biokeraba	17		340,000						17
Shewa	Ghion-Chitu-Wonchi	40		800,000					20	20
	Holeta-Inchi	30		600,000					10	20
	Ghion-Konokile	20		400,000	—	—	—	—	—	20
	Total New Projects	403		8,060,000		12	65	80	100	146
	Grand Total	1,027		20,540,000	209	226	189	110	100	146

RURAL ROADS STUDY

RURAL ROADS CONSTRUCTION SCHEDULE IN KMS., FY 1969 - 1974

Province	Project Description	Length Kms.	Standard	Project Cost (Birr)	1969	1970	1971	1972	1973	1974
	a. Ongoing Projects									
Bale	Dodola - Nensebo	100	RR30		40	60				
	Robe - Agarfa	25	RR30		20	5				
	Total Ongoing				60	65				
	b. New Projects									
Bale	Sorofta - Kokosa	35	RR10	803,500			35			
	Ali - Gassera	44	RR10	435,400			44			
	Goro/Sofomar Rd. - Elendo	224	RR10	4,221,600				80	80	84
Welega	Bako - Jiro - Shambu	66	RR50	2,826,000			66			
	Yubdo-Guliso-Chelya Eka-Bila	66	RR10	1,020,300				66		
	Hena - Kemeshe	35	RR10	111,000				15	20	
	Nejo-Jarso-Beji	125	RR10	2,022,000					40	65
Ilubabor	Metu-Gemero-Sibe	45	RR30	1,569,000			45			
	Dembi-Gatra-Sigmo	51	RR30	1,283,100			15	36		
	Metu-Supay	40	RR30	1,571,000				40		
	Ehud Gebeya-Becho-Yodotta	25	RR10	443,800					25	
	Yodota-Didulalo	36	RR10	943,300					36	
	Supay-Duba	13	RR30	407,200					13	
	Chewaka-Asendabo	22	RR30	390,500					22	
	Supay-Wellega Border	36	RR30	939,700					36	
	Bedele-Didessa River	43	RR30	1,168,500						43
Begemdir	Humera-Adi Reinos-Koraker	130	RR10	3,096,100			80	50		
	Robit-Delghi-Shahura	85	RR10	1,049,800				20	65	
	Titra-Betelhem	20	RR10	371,600					20	
	Titra-Tinafa-Nefas Moucha	95	RR10	2,387,000						95

Province	Project Description	Length Kms.	Standard	Project Cost (Birr)	1969	1970	1971	1972	1973	1974
Eritrea	Keru-Haiketa	60	RR10	674,700			60			
	Halhal-Aynat	40	RR10	763,040				40		
	Adi Felasit-Abune Endrias	12	RR10	179,040				12		
	Aideresso-Damas	30	RR10	634,620				30		
	Mai Limonat-Filfil	20	RR10	381,520					20	
	Tesenei-Gereset	18	RR10	202,410					18	
	Senafe-Arafalle	80	RR10	1,717,000					40	40
	Km 6-Asmara/Massawa Rd.-Durfo V	20	RR10	381,520						20
	Tzorona-Adi Kniu	35	RR10	522,200						35
Kefa	Bonga-Chiri	19	RR10	291,250			19			
	Bonga-Felege Selam-Ameya	60	RR10	2,131,900			60			
	Mizan Teferi-Debeka	29	RR10	441,750				29		
	Jamu-Chacha	15	RR10	190,450				15		
	Mizan Teferi-Sheko	19	RR10	308,900				19		
	Chida-Ameya	25	RR10	376,250					25	
	Atnago-Goma	60	RR10	673,550					60	
	Jamu-Debre Work	33	RR10	524,900						33
	Waka-Bale	40	RR10	1,255,550						40
Gojam	Weitet Abay-Daghi	17	RR10	254,085			17			
	Debra Markos-Erob Gebeya	40	RR10	1,056,920			40			
	Minasse Kola-Berekt	20	RR10	491,700			20			
	Erob Gebeya-Mota	65	RR10	1,719,950			20	45		
	Bichena-Shebel	25	RR10	376,250				25		
	Bulched-Yejube	35	RR10	385,550				27	8	
	Fagita-Dangia/Fafa	25	RR10	376,250					25	
	Mota/Bichena Rd.-Mertole Mariam	25	RR10	420,375					25	
	Chazni-Debate-Debre Zeyt	105	RR10	1,244,900					39	66
	Dangala-Aessebe	12	RR10	211,680						12
	Almahel-Bambudi	75	RR10	814,500						19
Shewa	Fitche-Silmi-Enaguade	40	RR10	825,175				40		
	Ginchi-Jeldu-Kachisi	100	RR10	2,402,100				40	60	
	Garabela-Ankober-Dulecha	50	RR10	796,625					20	30
	Nazret/Metehara Rd.-Dedecha	35	RR10	732,275						35

Province	Project Description	Length Kms.	Standard	Project Cost (Birr)	1969	1970	1971	1972	1973	1974
Harerge	Korahe-Gerogobi-Warder	120	RR30	2,292,000				70	50	
	Gursum-Bombas	18	RR50	722,800					18	
	Korahe-Debre Woyin Kelafo	125	RR50	2,726,500						70
Welo	Chifra-Burka	60	RR10	833,750				60		
	Mekane Selam-Ajibare	50	RR10	1,342,450					50	
	Burka-Bora	60	RR10	883,750					15	45
	Mekaneselam-Wegide	15	RR10	417,900						15
Tigre	Seleklela-Debre Kerba-Adi Seguar	56	RR10	1,071,410				56		
	Mychew-Mahoni-Chercher-Didigsala	150	RR10	2,246,260				10	35	35
	Aguala-Berahle	70	RR10	2,299,600					35	35
Gemu Gofa	Arba Minch/Konso Rd. - Felege Neway	167	RR10	3,277,230			87	80		
	Arba Minch/Sodo Rd. - Chencha	25	RR50	939,570			25			
	Arba Minch/Gidole Rd. - Sidamo Border	50	RR10	1,160,600				32	18	
	Turmi - Murle	60	RR10	601,200					60	
	Jinka-Mago Park H.Q.	45	RR10	973,350					34	11
Sidamo	Moyale-El Gof-Chelago-Melkamere-Sedi-Dolo	335	RR10	3,642,850					50	50
	Moyale-El Gof-Wachile*	100	RR10	1,124,500						20
Arusi	Robi-Ticho-Asela/Bekoji Rd.	78	RR50	2,317,500					78	
	Abomasa-Guna-Chole	45	RR50	1,265,100						45
Welega	Gelilla-Fuliye-Shamba*	192	RR10	3,164,800					50	70
Ilubabor	Dembi-Simeso-Yanfa-Kefa Bdr.	50	RR30	1,411,900						50
	Total New Projects	4391		85,534,305			633	937	1190	1063
	Grand Total	4516		88,474,305	60	65	633	937	1190	1063

Province	Project Description	Length	Standard	Project Cost (Birr)	1969	1970	1971	1972	1973	1974
	SUMMARY									
	Rural Roads Construction Projects due to RRC			56,900,000	335	537	544	352	271	229
	Rural Roads Construction Projects due to EPID			20,540,000	209	226	189	110	100	146
	Rural Roads Construction Projects due to Rural Roads Study			88,474,305	60	65	633	937	1190	1043
	GRAND TOTAL RURAL ROADS			165,914,305	604	828	1366	1399	1561	1418
	* Not all the length of the project is finished during the five-year program.									

9. Rural Roads to be Constructed by Other Development Agencies*

Province	Project	Length (km)	Development Agency	Year of Construction
Arussie	1. Huruta-Diksie-Robe	73	CADU	1976/77
"	2. Bokoji-Gobessa	30	"	1977/78
"	3. Ben-Ben-Jeju	45	"	"
"	4. Robe-Sedeka-Endatto	57	"	1978/79
"	5. Diksis-Kula	16	"	"
"	6. Robe-Dinkite-Seru	70	"	1979/80
Sidamo**	1. Washed Coffee	230	WCP	1977/80
Tigrai	1. Inda Selassie-Sheraro	120	TAHADU	Under Const.
"	2. Sheraro-Yerga Mereba RR	70	"	Programmed
"	3. Sheraro-Tekeze River	45	"	"

* Since all EPID Rural Roads Projects are to be constructed in the future by RRO, they are not included here.

** WADU Rural Roads Projects are being constructed below the minimum Rural Roads Standard of RR10.

D. Rural Roads Construction Program

1. Construction Methods

The rural roads are to be improved or constructed to minimal standards consistent with sound engineering practice. They are to be low cost roads which do not require detailed engineering surveys and design. The roads will be constructed by direct labor or force account method by the Construction Units of the Provincial Rural Roads Offices. The general policy will be to employ as much labor as possible on these road projects and the standards proposed for rural roads were prepared with this objective in mind. The construction units are mobile and can be moved from one location to another using the transportation resources available within the Province. The standards proposed require no heavy earthworks and therefore require no heavy earthmoving equipment. The choice between using a labor intensive or equipment intensive method of construction will depend upon:

a. The availability of a plentiful supply of unskilled labor near to the actual location of the construction work. This is essential to labor intensive type construction. The construction of camps for accommodating large numbers of unskilled labor, or transporting them from their villages for long distances to their place of work is costly and uneconomical.

b. The class of road to be built. The RR10 class with minimal earthworks and surfacing with minimal culverts or bridges is ideally suited to construction by labor intensive methods. Some construction plant is obviously essential, particularly for shaping and compacting the roadbed, but most of the operations required can be carried out manually. On the other hand, the RR50 class will involve heavier earthworks, gravel pavements, culverts, bridges, etc. and are more suited to equipment intensive construction.

c. The rate of progress or completion date required for the use of the road. This is often related to agricultural or other development schemes whereby the completion of a road project is an essential factor in the phasing of the scheme as a whole. As the number of unskilled laborers that can be usefully employed on a road are often limited by working space and for other reasons, the rate of progress of labor intensive road projects is often slower than those on which more construction equipment is use.

d. The terrain where the road is to be built. Roads in flat terrain obviously are the most suitable for labor intensive

methods while those in hilly or mountainous terrain, requiring material from excavations to be moved to embankments, are the least suitable. In between are a range of mixed terrains and careful consideration must be given to each road before deciding on the construction method to be used.

e. The location and length of road in a remote area could be more suitable for construction by a labor intensive type unit, as the transportation of construction equipment to this area for a very short period of time would be very expensive. On the other hand, long sections of road in remote areas where the population is scattered, are more suitable for equipment intensive methods.

f. The total cost of the construction of a road. There is insufficient evidence in Ethiopia on which to base a firm opinion as to whether labor intensive operations are cheaper or more costly than equipment intensive operations. However, from experiments carried out in Wollo Province, the Crown Agents Project Manager has indicated that labor intensive operations are generally more costly. However, this does not mean that labor intensive method should be ruled out where there is available a plentiful supply of unskilled labor that is unemployed or underemployeed.

g. The availability of equipment. It can be argued that equipment for construction can always be purchased and therefore its availability is not a serious factor. To purchase construction equipment for a single road project can, however, increase the cost of that project very considerably, unless it can be used afterwards for further road projects with only part of the capital cost needing to be charged to the first. Assuming continuing projects or considerable delays in obtaining all the construction equipment required, then consideration may well be given to using labor intensive methods with the bare minimum of plant.

The work is expected to be performed in the following manner:

a) Survey of Road: This work is done by hand labor and surveyoring instruments.

b) Clearing of the Right of Way: The clearing of the right of way should be accomplished by hand labor when it is readily available.

c) Formation of ditches and backslopes: Hand labor can be used to rough excavate ditches and dress backslopes. The final grading of the ditches and backslope should be accomplished with a motorgrader to insure good drainage.

d) Formation of Roadbed: The formation of the roadbed should be accomplished wherever possible with hand labor. Where the soil is too hard or rock is encounted, the use of equipment is required. A motorgrader should be used to accomplish the final

grading of the roadbed to insure a smooth and good riding surface. Where large cuts or fills are required it is necessary to use equipment such as bulldozers, loaders and trucks.

e) Drainage Structures: The placement of culverts and the construction of stone fords are ideal places for the use of hand labor. It may be necessary to use equipment to transport the culvert or stone from the place of manufacture to the job site. The excavation, placement of culverts and stone, construction of headwalls and backfill can and should be done using hand labor.

f) Access Roads: The construction of access roads is usually a combination of labor and equipment methods.

g) Borrow Pits: The clearing and grubbing for select material borrow pits is usually a combination of labor and equipment methods.

h) Excavating and Stockpiling Surfacing Material: The excavating and stockpiling of select material or gravel surfacing requires the use of a bulldozer. It is not practical to excavate this hard material by hand labor.

i) Loading and Hauling Surfacing Material: This operation can be a combination of hand labor and equipment when using small farm tractors pulling tipping trailers. The select material or gravel surfacing can be loaded by hand labor or a loader. When dump trucks are use, it becomes uneconomical to use hand labor to load them because of the high cost of the truck sitting idle while it is being hand loaded. This project is designed to utilized both methods.

j) Spreading and Compacting Surfacing Material: The spreading of the select material or gravel surfacing can be effectively done by hand labor. It is essential that equipment rollers be used for the compacting of select material and gravel surfacing.

k) Final Dressing of Surfacing Material: It is essential that the final shaping and fine grading of the surfacing be done with a motorgrade to insure a smooth surface necessary for a good riding road.

2. Role of Labor in Construction

In recent years considerable literature covered the subject of labor intensive and capital intensive methods of construction, particularly in regards to its application to highway construction and maintenance. Considerable controversy continues to exist as to the merit of labor intensive work in view of the fact that specialized equipment has been developed specifically to be more efficient than

hand labor and to provide better quality in road works.

However, equipment represents a heavy investment that can only be amortized over a period of years. This means that during its useful life it must be used extensively on a long kilometrage of roads and the lower the road standard, the greater the number of kilometers. Secondly, equipment requires skilled operators and sophisticated maintenance. More often than not, these are not available in developing nations and the equipment ends up realizing only a portion of its useful life (a fact which is never reflected in calculations of equipment cost.). Finally, equipment becomes increasingly less suitable and more costly as work volumes per kilometer decrease.

Labor can be deployed over a broad front (provided it is available, i.e. lives nearby or is encamped) and in a large number of locations at the same time, which equipment cannot.

Provided speed is not critical, labor is capable of executing large volumes of work by steady application of effort. It requires direction and management if quality work is to be produced, but does not require a similar sophistication in other support efforts. It does, however, require a very high degree of planning and coordination if it is to be used effectively.

In planning the use of labor intensive methods, an understanding of a few underlying principles is of paramount importance.

a) Labor works, or produces, slowly even in sizeable groups, when compared to equipment.

b) Equipment standing by to wait for labor (such as a dump truck being hand loaded) is an inefficient and costly process.

c) Therefore, the simultaneous use of equipment and labor must be minimized and only the least expensive items of equipment assigned to accompany work that is being performed by labor.

The commonly used phrase "an optimum mix of labor and equipment" is generally misleading. It applies only to a few work activities where low cost equipment (such as trailers) can be allowed to stand while being hand loaded and then drawn by a faster towing unit so as to keep the latter fully occupied. It will be noted in this example that the equipment is being used on a haul activity for which manpower is notably inefficient because of its low travel speed and limited carrying capacity.

A major piece of research completed by the World Bank has indicated to some extent the choice of high technology for road building.(1) It is not possible here to summarize all the findings of this enormous study, but the major finding is as follows:

> "Traditional labor intensive techniques currently in use are not economically competive with modern capital intensive techniques, even in labor abundant economics when labor is "shadow priced" at a fraction of market wages. This is because (a) existing labor-intensive techniques are employed in an atmosphere where primary emphasis is on employment creation rather than efficient use of labor, and (b) existing methods are primitive and do not employ elementary mechanics effectively, if at all. These factors result in extremely low labor productivites."

Such a finding by researchers in an institution as prestigious as the World Bank can be construed as bad news for those economists and planners who have pushed for the use of labor-intensive methods, and good news for the equipment manufacturers and exporters. However, a second finding in the same study mitigates the above to some extent.

> "Techniques currently in use in civil construction are either highly labor-intensive or highly equipment-intensive; no significant intermediate techniques are practiced. Where attempts have been made to combine traditional labor-intensive methods with modern equipment operations, the resulting "mixed" method obtains such inefficient use of the equipment that it in fast requires more capital than a fully equipment - intensive operation and is highly inefficient."(2)

A good example of "creeping mechanization" is the Arba Minch-Konso-Zjanka road. It was started with every intention of using as much labor as possible. Earth and volcanic ash had to be excavated, hauled, spread, and compacted to form the road base and surfacing, respectively. Progress was too slow and costs were too high using labor. A front end loader was employed together with a grader and an excellent all weather road was constructed in a shorter time. Now only clearing and grubling and masonry construction remain highly labor oriented.

With regard to the fully labor-intensive methods the Bank report is quite blunt:

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(1) See; "Study of the Substitution of Labor and Equipment in civil construction: Phase II Final Report. "IBRD staff working paper No. 72.

(2) Ibid

"Management and supervision of large labor forces requires special skills, experience, and organization; quite different from equipment intensive operations. Labor intensive methods should not be attempted without careful advance planning, organization and training, particularly in regions where these methods have not been commonly practiced."

Despite disappointing results to date, in the construction of the minimum standard roads, the operations that are considered suitable for labor are:

Operation Description	Tools and Equipment
Clearing brush	Machetes, axes, saws and scythes
Grubbing (roots or stumps)	Spades, pickaxes, hoes, shovels,
Stripping top-soil and stock-piling it	Spades, shovels, ploughs, rakes wheel barrows (or Dobney barrows carrying baskets or boxes)
Excavation (earth)	Spades, pickaxes, hoes, shovels, crowbars
Loading and placing excavated earth into small tipping trailers (for haul by tractors)	Spades, pickaxes, shovels crowbars
Excavation Select Borrow (for haul by trainers)	(See Excavation - earth)
Screening select materials	Shovels, spades, standing screen
Plaving setstone, or stone paving or	Crowbars, pickaxes, shovels, sledgehamers, wheel barrows
Dry masonry	(Same as above)
Mortared masnory	(Same as above plus mixing tray, trowels, water baskets)
Gabion caissons	(Same as dry masonry with wire baskets, pliers, wire, gin pole or A-frame and pulley)

Erecting timber or precast bridge desk sections	Same, hammers, gin-poles or A-Frames and pulleys
Filling and placing sandbags	Shovels, spades
Spreading, grading and fine grading	Rakes, shovels, and brooms
Construction formwork	Carpenters tools and lumber
Batching concrete (small mixers)	Shovels, loading boxes, cement, water buckets
Placing concrete	Wheel barrows, dobney, barrows, vibrators, shovels, spades

The complementary equipment intensive operations, needed on minimum standard road construction, that can be foreseen are:

Compaction	Tractor (small) towed roller
Watering	Animal or tractor (small) towed water tank
Fine grading, slopping and ditching	Motorgrader

<u>Dig and load and haul earth roadway excavation and select surfacing (100 m to 10 km round trip haul)</u>

A balanced crew is needed composed of:

- Tractor dozer (part-time) to construct haul road, strip barrow areas, and stockpile material.
- Laborers to dig and load
- Tipping trailers in numbers suitable for haul distance reserve

The objective is to furnish material to job site at least possible cost (most efficient manner), after the earthworks had been done.

Dig haul load common borrow and select surfacing (Haul over 10 km round trip)

An equipment intensive crew would best fill this function when greater haul distance are required.

- Tractor dozer (as above)
- Front end loader (1)
- Dump track in suitable numbers

This might apply to black cotton soil areas which cannot be avoided and where in-site materials are totally unsuitable for embankments. It is hoped that for minimum standard roads these conditions should generally be avoided - even at the cost of considerable increase in travel distances.

Drill and blast rock

Here semi-labor intensive methods applicable for quantity rock removal, therefore, smaller compressors with jackhammers are used rather than wagon drills.

The equipment: 250 cfm compressor

45 - 60 lb hammers with rock bits and steels, explosives, caps and detonators.

This crew would not be mobilized until hand labor had exposed and cleaned rock outcrops, generally in several locations, so that the crew could move from one to the other.

Compaction (embankment and surfacing)

Tractor drawn rollers (grid for cohesive soils and vibratory for granular soils) are generally more satisfactory than draught animals if there are other tasks for these animals (hauling trailers, watertanks, rocks, etc).

Watering

(See above)

3. National Rural Roads Construction Program (Ethiopian Fiscal Year 1969 = FY 1977) (km)

	1969	1970	1971	1972	1973	1974	1970-74
Ongoing-RRC	335	427	404	217	161	19	1228
New - RRC	---	110	140	135	110	210	705
Sub-total	335	537	544	352	271	229	1933
Ongoing -EPID	209	214	124	30	-	-	368
New - EPID	-	12	65	80	100	146	403
Sub-total	209	226	189	110	100	146	771
Ongoing-RR Study	60	65	-	-	-	-	65
New - RR Study	-	-	633	937	1190	1043	3803
Sub-total	60	65	633	937	1190	1043	3868
Total	604	828	1366	1399	1561	1418	6572

4. The Rural Roads Construction Program by Administrative Region E.F.Y. (1970-1974)

Administrative Region	Total	1970	1971	1972	1973	1974
Arrusi	123	-	-	-	78	45
Bale	696	192	189	150	101	64
Begemidir	330	-	80	70	85	95
Eritrea	315	-	60	82	78	95
Gemu Gofa	690	100	215	182	182	11
Gojjam	576	73	132	122	122	127
Harrargie	905	126	131	170	208	247
Illubabor	361	-	60	76	132	93
Keffa	421	27	114	88	100	92
Sidamo	231	70	41	-	50	70
Shewa	463	60	58	110	110	125
Tigrai	555	50	70	136	140	159
Wellega	392	-	66	81	110	135
Wollo	537	130	150	132	65	60
	6593	828	1366	1399	1561	1418

E. Rural Roads Maintenance

The proposed maintenance program for the provinces of Gemu Gofa and Gojam consist of one unit large enough to be divided into two identical sets giving the Provinces an opportunity to field two maintenance crews and use a maximum of local labor. These crews would be able to operate separately for normal maintenance increasing the road maintenance capability and quality.

It is proposed that each crew operate from a light mobile camp capable of housing and feeding the twenty plus or minus regular crew employees needed to accomplish maintenance. The camps should be constructed of moveable panels so that the camps can easily be moved. It may be practical to set up camps so that the crew's could operate at a radius of 50 kms. from the camp sites. Each crew would employ 100 local laborers to work the section of road within their Peasant Association limits.

One Motorgrader and two farm tractors with four hydraulic tipper trailers, is the equipment assigned to each crew to support the 100 laborers. With this equipment and labor mix, it is anticipated that each crew can maintain the maximum kilometerage of road each year.

It is anticipated that in the first year of the program, there will not be enought kilometers of rural roads constructed to the RR10 standard to utilize the full time of the proposed maintenance crew. During this year the maintenance crew will be utilized in upgrading already existing roads to RR10 standards in places of Gemu Gofa and Gojam where it is feasible to do so.

Normally the maintenance crews would accomplish the following:

1) Clean, regrade and back slope ditches.

2) Grade and reshape road bed.

3) Replace, clean or daylight culverts.

4) Replace, daylight or regrade fords.

5) Paint, redeck, repair bridges and abutments.

6) Repair and help prevent errosion.

7) Grade and add select material or surfacing to extent necessary.

8) Improve drainage by adding culverts, fords, or ditches.

9) Stockpile select fill materials for emergencies.

10) Generally preserve the original condition and quality of the road but not necessarily be limited to the above tasks.

It is anticipated that some areas will require very little work to keep in good condition while others may require considerable heavy maintenance for fairly long stretches. Under these conditions, it is not desirable to establish general rules for frequency of operations. However, it is estimated that both crews together can maintain about 600 kms. per year.

At times there may be emergency heavy duty maintenance required. For example, cuts or other repairs necessary to keep the road open to traffic. If additional resources are required to cope with these conditions, the Headquarters Augmentation Unit may be utilized.

Traditionally when roadway maintenance is organized it is divided into routine and periodic maintenance. The former is needed frequently and continuously; including such functions as grass cutting, ditch cleaning, shoulder reshaping; etc. The latter is needed infrequently and consists of re-surfacing.

Resurfacing would be done as and when required to keep the road motorable in accordance with minimal standards for rural roads maintenance. Routine type maintenance should include spot resurfacing. Hence only heavy routine maintenance is considered applicable to rural roads. The design of roads built to a higher standard at considerable cost, has of course, protection against such failures. The inexpensive construction methods of low grade rural roads implies that a high risk of spot failures has to be accepted. These repairs are included in the above described heavy routine maintenance.

Rural Roads Maintenance Program in Km

EFY 1970 - 1975

	Administrative Regions	1970	1971	1972	1973	1974	1975
1	Bale		265	505	505	755	979
2	Wellega			66	132	167	392**
3	Illubabor			45	136	268	361
4	Begemder				130	235	330
5	Eritrea			60	142	220	315
6	Keffa	17	79	193	281	381	473
7	Gojam	102	175	307	429	551	678**
8	Shewa	162	162	240	385	485	660
9	Harrergie	18	18	215	215	353	870**
10	Wello	325	325	325	777	827	902
11	Tigrai				56	385	605**
12	Gomu Gofa	55	155	370	552	734	745
13	Sidamo	240	240	480	480	480	600**
14	Arussi*					78	143
	Total	919	1419	2806	4220	5919	8053**

*It is assumed that Development Agencies such as CADU will continue to maintain the roads they construct until such time as the Rural Road Organization is well established and able to assume the job.

**One or two projects will continue into the next sector program. The figure includes that portion of the road expected to be completed by the end of the first sector.

F. Self-help Roads

(See Annex G for separate discussion of self-help roads.)

IV. Technical Feasibility

A. Appropriateness of Technology

This program will provide dry weather rural roads between the population centers of the rural poor and the nearest all weather roads. The general standards adopted by ERA are the minimum required to provide this access. The mix of labor intensive methods and equipment methods is considered to be the best means of meeting the needs of rapid development of an expanded rural roads network while maximizing the use of unskilled labor wherever possible.

The selected routes follow existing tracks. The selected alignments will pass through the least difficult terrain connecting the terminal points of each road.

The rural roads now under construction are being constructed in a satisfactory manner but lag behind schedule in part due to security conditions but also because of equipment outage and periodic labor travels. However the results of existing construction methodologies indicate that the technology presently being used on rural roads is satisfactory and as somewhat modified by this project, probably the best that can be developed for the country.

The RRO/ERA is planning to procure a limited amount of equipment and hand tools to be used by hand labor prior to the arrival of the equipment. This will allow the construction work to begin in both Gemu Gofa and Gojam Provinces prior to the arrival of the major pieces of equipment.

Once the major equipment items arrive in Year Two of the project, road construction and maintenance should get underway in accordance with the schedule shown herein. It is judged technically feasible to build, rehabilitate and maintain approximately the kilometrage of road proposed using the amounts of equipment and labor proposed. Given more or less normal conditions the targets can and should be met.

B. Equipment

1. Equipment Selection

The project is designed to be as labor intensive as possible within the limits exposed by time and finance. The equipment requirement necessary to achieve the goals of this project have already been discussed in terms of the requirements for the (light) Construction Unit, Maintenance

Units and Augmentation Units. Two other elements of the project which affect the selection and use of the proposed equipment have yet to be discussed: repair parts support and equipment maintenance.

2. Repair Parts Support

Spare parts support has been a problem in existing rural roads projects and will continue to be a problem in the implementation of this Rural Roads Project. The problem will be minimized to a certain extent by the inclusion of the new Rural Roads Organization as a unit of the Ethiopian Roads Authority. The Rural Roads Organization will have the same support from the ERA Central Warehouse and Procurement Branch operations for repair parts procurement, warehousing and distribution as the Highway Organization.

A recent evaluation of the procurements, warehousing and distribution system of the ERA indicated that the system is good and is adequately staffed with technically skilled personnel to support the Highway Agency, but is not presently staffed to support the large rural roads program nor does it yet have specific directions to provide this support on an equal basis to the RRO.

The support presently being provided to the Rural Roads Division projects by the Central Warehouse of ERA is not fully satisfactory. The causes of the less than optional support are fourfold; i) insufficient number of technically skilled personnel at the Central Warehouse to support the rural roads projects; ii) lack of a specific follow-up system for securing repair parts on a timely basis for the rural roads projects; iii) the long distance from the Central Warehouse to the scattered rural roads projects sites and the resulting communications difficulties; and iv) the general lack in availability of off-shelf repair parts in Ethiopia.

The 5-year program will provide additional technically skilled personnel to the Central Warehouse of the ERA and additional warehouse personnel eventually in each of the fourteen provinces. These additional personnel will be trained under the program funded by the World Bank and European Economic Community as discussed in the Manpower Analysis Annex.

The RRO will provide the funding for additional personnel to be assigned to the Central Warehouse to handle the extra work load produced by the Rural Roads Program. These personnel will provide the same service to the RRO as is nowprovided to the Highways Organization which should provide a satsfactory follow-up system for rural roads repair parts.

Each province will have its own small warehouse for stocking a small supply of fast moving repair parts . It will be staffed with technically skilled personnel to identify, procure from the Central Warehouse and distribute to the individual projects the required spares. The province Warehouse will have direct radio communications with the Central Warehouse and with each project in the province.

The ERA will have to improve and enlarge its direct off-shore procurement of repair parts. In the near future, it is anticipated that almost 90 percent of repair parts will have to be purchased by the ERA directly from the suppliers in the source country. The World Bank project will train the necessary personnel and the AID project will provide the required funding for purchase of repair parts for the Rural Roads Program in Gemu Gofa and Gojam.

It is intended that the necessary repair parts will be provided for three years operation of the equipment purchased under this project and also to repair and maintain selected existing equipment identified in the Louis Berger International, Inc., Inventory and Rehabilitation Report of Non-ERA Highway Equipment, that is being made available to the new RRO.

This report identified 614 pieces (90 salvage) in the fourteen (14) provinces. Most of this equipment belongs to either a municipality or development project and will probably not be available to the Rural Roads Organization. It is estimated that about 10 percent of this equipment will be made available to the Rural Roads Organization. It is estimated that it will cost $1,308,451 to rehabilitate all the equipment. This project will provide $130,845 for repair parts to rehabilitate the 10 percent made available to the Rural Roads Organization. in the two provinces.

3. Equipment Maintenance

Equipment maintenance has been a major problem in the implementation of ongoing rural roads construction. Under the proposed project, the new Rural Roads Organization will have its own equipment repair facilities in each of the provinces to perform maintenance up through echelon III and if necessary some echelon IV maintenance.

The central maintenance facility in Addis Ababa and the nine area maintenance facilities of the Highway Organization will provide echelon IV through VI equipment maintenance for the Rural Roads Organization on an equal basis with the Highways Organization.

An evaluation completed in 1976 of the Highway Equipment Repair Facilities (HERF) (constructed under AID Loans 663-H-017 and 017A) shows that the HERFs have adequate facilities and equipment to support the new rural roads program.

This project will provide the additional personnel required for rural roads equipment maintenance and these personnel will be assigned to the various facilities where they are needed. Training will be a component of the IDA training program.

The construction units and maintenance units are equipped to perform day-to-day routine maintenance and servicing. Middle level maintenance will be performed at the provincial RROs and heavy maintenance will be done at the HERFs at Shashamane and Debre Markos.

4. Manpower Analysis

(See Annex D for separate discussion of manpower and training.)

5. Technical Assistance

AID will finance a minimum number of expatriate personnel to assist the new Rural Roads Organization in establishing its national operations with particular emphasis on the Provinces of Gemu Gofa and Gojjam. This assistance will be provided in the fields of construction and maintenance of rural roads, supply management, warehousing and procurement, equipment maintenance and operation, and selected training of personnel in fields related to rural roads. A direct or host country contract will be signed with an American firm to provide the following personnel.

a. Technical Expertise

The technical expertise to be provided is as follows:

1) Road Engineer: ($314,900)* To be provided for to work directly with the Head of the RRO in providing technical expertise to the new national RRO with emphasis on Gemu Gofa and Gojjam. This individual must have considerable experience in the construction of low cost roads. This experience must include management, organization, road construction and maintenance. He will be responsible for providing assistance to the Director of RRO in setting up the new organization, developing management procedures and providing guidance in the methods of low cost rural road construction and maintenance. He will provide assistance both to the Central Organization and the Provincial Organization especially Gemu Gofa and Gojjam Provinces. He will also supervise the other member of the advisory team. He must be a graduate in Civil or Highway Engineer with supervisory experience in the fields listed above.

* See Technical Assistance Attachment to this Annex for detailed cost estimates.

2) Equipment Specialist: ($225,074) The equipment specialist will be assigned to Addis Ababa to work directly with the Manager of the Equipment Section of the RRO. He will also be required to travel extensively to the provinces to work with the Equipment Managers in the provinces especially the provinces of Gemu Gofa and Gojjam. This individual must have considerable experience in road equipment selection, maintenance and operation. He will work with the RRO equipment manager in establishing procedures and policies for the selection of equipment, maintenance of equipment by the ERA Central Workshop and Area Workshop, and setting up and operating the Provincial Workshops in Gemu Gofa and Gojjam Provinces. He will provide three man years of service.

3) Rural Roads Training Specialist: ($189,860) The Rural Roads Training Specialist will be assigned to the Alemgena Training Center at Addis Ababa. He will be required to travel to the provinces of Gojjam and Gemu Gofa to evaluate training needs. He will work with the Alemgena Training Supervisor to develop courses needed for the training program established for the Rural Road Organization. He will be required to develop courses in surveying, equipment mechanics, equipment operation, construction supervisors, construction foreman, accountants, gang foremans, and office clerks in the specific field of low cost rural roads. In addition he will develop specialized training courses specifically for the self-help roads component. He must have a degree in engineering or education and have experience in developing training courses in developing countries in the field of highways and low cost roads. He will provide two years of service. He must be able to develop the above course for both construction and maintenance of low cost roads.

4) Procurement and Supply Specialist: ($86,722) The Procurement and Supply Specialist will be assigned to the Central Rural Roads Office in Addis. He will be required to travel to the provinces of Gojjam and Gemu Gofa. He will work with the procurement and supply offices of the RRO in developing procurement procedures for equipment, repair parts, and materials and supplies. He will train the procurement specialist on the job. He will work with the warehousing specialist in stocking and distribution of repair parts and supplies. He will also work with the procurement and warehousing specialist in the provinces of Gojjam and Gemu Gofa in establishing procedures for the establishment and operation of the Provincial Warehousing facilities in repair parts and supplies. He must have at least 15 years experience in the field of procurement, warehousing and distribution of repair parts and supplies. He will be able to teach technicians how to use parts manual for all types of equipment to order repair parts at both the central and provincial level. He will be provided initially for 12 months service.

5) Organization and Management Expert: ($34,040) The Rural Roads Organization is being established as a new semi-autonomous unit of the ERA and requires an experienced organization and management specialist to help RRO optimize internal organization and management procedures and to review and make recommendations regarding the working relationships and responsibilities between RRO and the Highways Organization units providing support services to the RRO. This specialist would be stationed in Addis Ababa and would be required for 6 months.

6) Trainer in Technical Report Writing: ($34,040) He will be required to develop and teach technical report writing for Ethiopian technicians. He will be required to develop an Ethiopian capability to teach follow-up technical report writing courses. He will be stationed in Addis Ababa in the Central Office of RRO and will work principally at the Alemgena Training Center. He should have a degree in Engineering with considerable experience in technical report writing in the roads field. He will provide 3 to 6 months of service.

7) Engineer: ($34,040) He will be required to develop a training course for rural roads supervisors in both construction and maintenance. He will develop the capability of an Ethiopian Instructor to conduct the course after he leaves. He should have a degree in engineering and be a qualified teacher. He must have had experience in the construction and maintenance fields and be able to develop a course specifically for low cost rural roads. He should have experience in working and or teaching in the field of low cost rural roads. He should have prior experience in working with developing country personnel. He will be stationed in Addis Ababa with up-country trips required to follow-up his Alemgena training sessions.

8) Accountant: ($34,040) Required to develop a course for training accountants for the central headquarters, provincial headquarters, construction and maintenance projects. This instruction will focus on construction-related cost accounting. He should have a degree in accounting and training experience. It is perferred that he have experience with working with personnel from developing countries. He will be required to provide six months of service and will be stationed in Addis Ababa.

6. Reasonableness of Cost Estimate

Cost estimates used for equipment and technical assistance are based on prices of equipment and consultants for recent (May 3, 1977 for equipment) AID financed projects in Ethiopia and adjacent countries in Eastern Africa area and AID/Washington furnished up-to-date cost data.

Cost estimates for GOE/ERA inputs for labor, POL, construction, hand tools, construction materials and related items are based on prices furnished by the ERA based on their actual experience with on-going Rural Roads activities.

A price escalation factor of 7 percent for one year and a contingency factor of 10 percent have been added to basic cost estimates for equipment. Present prices have been used for all other items such as POL, repair parts, labor and materials for year one of the project. A 10 percent escalation factor per year has been used for these items for Years Two and Three of the project.

7. Environmental Assessment

An Initial Environmental Examination preparted for this project indicates that no significant problem areas exist or are likely to develop. Thus a negative determination was made. See the Environmental Annex (Annex C) for details.

8. Summary and Conculsions

The Technical Analysis fof this project was prepared by Louis Berger International, Inc., and USAID/Ethiopia Engineering with assistance provided by the GOE/ERA/Rural Roads Division and REDSO/EA Engineering has determined that the analysis presented in the project paper are consistent with sound engineering principles applicable to the type and method of construction used in Ethiopia.

Section 611(a)(1) of the FAA related to technical, engineering plans and cost estimates is considered to have been satisfied. Due to the nature of the rural roads construction, it is not necessary or economical to develop detailed engineering plans for the construction projects contained herein. Each road was visited during preparation of the Project Paper and all problems and recommendations for construction are contained in this paper. Typical cross-sections, drainage structures and minimum standards have been established by the ERA/RRO and agreed to by the USAID Engineer. The New Rural Roads Organization being established under this project will perform centerline surveys and establish the exact location of the roads along the corridors located during design of this project. The cost estimates have been verified by Louis Berger International, Inc., and USAID Engineering.

Section 611(e) related to the effective maintenance of the improved road facilities is determined to be satisfied with regard to the capability of the New Rural Roads Organization to maintain the proposed roads during the construction and continue maintenance operations after completion of the construction activities. The

project provides for the establishment of a new Maintenance Unit in the provinces of Gemu Gofa and Gojjam. The project provided units are adequate for the first five-year rural roads program in these two provinces. Additional Maintenance Units will be provided by the ERA/RRO when they become necessary. The EPMG has provided assurances that the Government will continue financing and maintaining rural roads in these provinces. Written assurances will be included as part of the Project Grant Agreement.

Annex B

ATTACHMENT 1

Costing Details for:

Equipment

POL

Spares

Table 1

EQUIPMENT SUMMARY
GAMO GOFA AND GOJAM PROVINCES

Equipment

	Equipment Description	No. Units	Unit Cost	Total Cost
1.	Tractor, Grawler, 180 hp	6	105,000	630,000
2.	Motorgrader, 125 hp	10	55,000	550,000
3.	Tractor, Farm, 75 hp, 4x4	20	15,000	300,000
4.	Trailer, Hydraulic Tipping, 4 cm	32	4,500	144,000
5.	Frontend Loader, 1 1/2 cy	2	58,000	116,000
6.	Roller, S.W., S.P., 8-10 T	2	33,000	66,000
7.	Roller, S.W., Towed	4	4,200	16,800
8.	Trailer, Fuel, 750 g., Tlr. Mtd.	6	5,000	30,000
9.	Trailer, Water, 750 g., Tlr. Mtd.	6	5,000	30,000
10.	Crusher, 15 tph	2	75,000	150,000
11.	Crusher, 5 tph	2	50,000	100,000
12.	Concrete Mixer	4	3,000	12,000
13.	Air Compressor w/Tools, 365 cfm.	2	36,000	72,000
14.	Welder, 300 amp, Tlr. Mtd.	2	8,500	17,000
15.	Truck, Pickup, 3/4 T, 4x4	14	9,000	126,000
16.	Suburban, 4x4	8	9,000	72,000
17.	Shop Crane, 10 T., Mobile	2	15,000	30,000
18.	Truck, Flatbed, 5-7 T	6	24,000	144,000
19.	Truck, Flatbed, 10 T	2	35,300	70,600
20.	Truck, Dump, 5 cm., 4x2	12	31,000	372,000
21.	Truck, Water, 2000 g., 4 x 2	2	42,400	84,800
22.	Truck, Fuel, 2000 g., 4x2	2	42,400	84,800
23.	Truck Tractor w/50 T Lowbed Tlr.	2	107,000	214,000
24.	Generator, 15 kva	4	12,100	48,400
25.	Tank, Fuel, 500 g., stationary	4	2,500	10,000
26.	Water Pump, Stationary	4	500	2,000
27.	Water Pump, 60 gpm, Tlr. Mtd.	6	1,500	9,000
28.	Grease Unit, Tlr. Mtd.	2	13,500	27,000
29.	Radio, Mobile, SSB, 100W	4	1,500	6,000
30.	Radio, Base, SSB, 100W	2	2,000	4,000
31.	Mechanic Tool Sets	10	500	5,000
32.	Survey Equipment Sets	10	2,000	20,000
33.	Camp Workshop Tools and Equipment	4	5,000	20,000
34.	Province Workshop Tools and Equipment	2	99,000	198,000

Total Project Equipment Cost May 1977	3,781,400
Inflation at 7 percent for one year	264,700
Total Equipment Cost and Inflation	4,046,100
Contingency at 10 percent	404,600
Total Equipment Cost	4,450,700

MAINTENANCE UNIT

LABOR INTENSIVE METHODS

GOJAM AND GEMU GOFA PROVINCES

P.O.L. FOR EQUIPMENT

Equipment Description	No. Units	Months Worked	Monthly Cost	Annual Cost
1. Motorgrader, 125 hp	2	12	$ 454	$ 10,896
2. Tractor, Farm, 75 hp, 4x4	4	12	244	11,712
3. Truck, Pickup, 3/4T, 4x4	1	12	361	4,332
4. Truck, Flatbed, 5-7T	1	12	282	3,384
Total Unit Cost				$ 30,324

TIRES FOR EQUIPMENT

Equipment Description	No. Units	Months Worked	Cost Month	Annual Cost
1. Motorgrader, 125 hp	2	12	$ 168	$ 4,032
2. Tractor, Farm, 75 hp, 4x4	4	12	187	8,976
3. Trailer, Hydraulic Tipping, 4 cy	8	12	70	5,720
4. Trailer, Fuel, 750 g, Tlr. Mtd.	1	12	35	420
5. Trailer, Water, 750 g, Tlr. Mtd.	1	12	35	420
6. Truck, Pickup, 3/4T, 4x4	1	12	70	840
7. Truck, Flatbed, 5-7T	1	12	188	2,256
Total Unit Cost				$ 22,664

REPAIR PARTS FOR EQUIPMENT

Equipment Description	No. Units	Months Worked	Cost Month	Annual Cost
1. Motorgrader, 125 hp	2	12	$ 300	$ 7,200
2. Tractor, Farm, 75 hp, 4x4	4	12	42	2,016
3. Trailer, Hydraulic Tipping, 4 cy	8	12	4	384
4. Trailer, Fuel, 750 g, Tlr. Mtd.	1	12	6	72
5. Trailer, Water, 750 g Tlr. Mtd.	1	12	6	72
6. Truck, Pickup, 3/4T, 4x4	1	12	50	600
7. Truck, Flatbet, 5-7T	1	12	102	1,224
Total Unit Cost				$ 11,568

Table 2

EQUIPMENT

PROVINCE HEADQUARTERS AND SHOP

(TYPICAL)

EQUIPMENT

	Equipment Description	No. Units	Unit Cost	Total Cost
1.	Car, 4x4	3	$ 9,000	27,000
2.	Truck, Pickup, 3/4T, 4x4	3	9,000	27,000
3.	Shop Crane, 10T, Mobile	1	15,000	15,000
4.	Heavy Duty Repair Shop Tools & Eq.	1	30,000	30,000
5.	Welding Shop Tools and Equipment	1	15,000	15,000
6.	Body Shop Tools and Equipment	1	5,000	5,000
7.	Electric Shop Tools and Equipment	1	10,000	10,000
8.	Machine Shop Tools and Equipment	1	20,000	20,000
9.	Lubrication Shop Tools and Equipment	1	10,000	10,000
10.	Washing Shop and Equipment	1	2,000	2,000
11.	Tire Repair Shop Tools and Equipment	1	2,000	2,000
12.	Carpenter Shop Tools and Equipment	1	5,000	5,000
13.	Radio, Base, SSB, 100W	1	2,000	2,000
14.	Surveying Equipment Sets	3	2,000	6,000
	Total Unit Cost			$ 176,000

EQUIPMENT: POL, TIRES, REPAIR PARTS

PROVINCE HEADQUARTERS AND SHOP
GOJAM AND GEMU GOFA PROVINCES

P.O.L. FOR EQUIPMENT

	Equipment Description	No. Units	Months Worked	Cost Month	Annual Cost
1.	Car, 4x4	3	12	$ 349	$ 12,564
2.	Truck, Pickup, 3/4T, 4x4	3	12	361	12,996
3.	Shop Crane, 10T	1	12	244	2,928
	Total Unit Cost				$ 28,48[illegible]

TIRES FOR EQUIPMENT

	Equipment Description	No. Units	Months Worked	Cost Month	Annual Cost
1.	Car, 4x4	3	12	$ 55	$ 1,980
2.	Truck, Pickup, 3/4T, 4x4	3	12	69	2,484
3.	Shop Crane, 10T	1	12	56	672
	Total Unit Cost				$ 5,136

REPAIR PARTS FOR EQUIPMENT

	Equipment Description	No. Units	Months Worked	Cost Months	Annual Cost
1.	Car, 4x4	3	12	$ 50	$ 1,800
2.	Truck, Pickup, 3/4T, 4x4	3	12	50	1,800
3.	Shop Crane, 10T	1	12	97	1,164
4.	Heavy Duty Shop Equipment	1	12	125	1,500
5.	Welding Shop Equipment	1	12	63	756
6.	Body Shop Equipment	1	12	21	252
7.	Electric Shop Equipment	1	12	42	504
8.	Machine Shop Equipment	1	12	83	996
9.	Lubrication Shop Equipment	1	12	42	504
10.	Washing Shop Equipment	1	12	8	96
11.	Tire Repair Shop Equipment	1	12	8	96
12.	Carpenter Shop Equipment	1	12	21	252
13.	Radio, SSB, 100W	1	12	8	96
14.	Surveying Equipment	3	12	8	288
	Total Unit Cost				$10,104

EQUIPMENT AUGMENTATION UNIT

LABOR INTENSIVE METHODS

GOJAM PROVINCE

P.O.L. FOR EQUIPMENT

	Equipment Description	No. Units	Months Worked	Cost Month	Annual Cost
1.	Tractor, Crawler, 180 hp	1	8	$ 797	$ 6,376
2.	Motorgrader, 125 hp	1	8	454	3,632
3.	Frontend Loader, 1 1/2 cy	1	8	401	3,208
4.	Roller, S.W., S.P., 8-10T	1	8	244	1,952
5.	Crusher, 15 tph	1	8	454	3,632
6.	Crusher, 5 tph	1	8	244	1,952
7.	Concrete Mixer	2	8	73	1,168
8.	Air Compressor w/Tools, 365 cfm	1	8	244	1,952
9.	Truck, Pickup, 3/4T, 4x4	1	12	360	4,320
10.	Welder, 300 amp, Tlr. Mtd.	1	8	83	664
11.	Truck, Dump, 5 cm, 4x2	6	8	460	22,080
12.	Truck, Water, 2000g	1	8	247	1,976
13.	Truck, Fuel, 2000 g	1	8	247	1,976
14.	Suburban, 4x4	1	12	349	4,188
15.	Truck, Flatbed, 10T	1	8	247	1,976
16.	Water Pump, 60 gpm, Tlr. Mtd.	1	8	83	664
17.	Truck Tractor w/50 T Lowbed	1	12	714	8,568
18.	Grease Unit, Tlr. Mtd.	1	12	64	768
	Total Unit Cost				$71,052

EQUIPMENT AUGMENTATION UNIT

LABOR INTENSIVE METHODS

GOJAM PROVINCE

TIRES FOR EQUIPMENT

	Equipment Description	No. Units	Months Worked	Cost Month	Annual Cost
1.	Motorgrader, 125 hp	1	8	$ 168	1,344
2.	Frontend Loader, 1 1/2 cy	1	8	1,750	14,000
3.	Air Compressor, w/tools, 365 cfm.	1	8	18	144
4.	Truck, Pickup, 3/4T, 4x4	1	12	69	828
5.	Welder, 300 amp, Tlr. Mtd.	1	12	10	120
6.	Truck, Dump, 5cm, 4x 2	6	8	281	13,488
7.	Truck, Water, 2000 g	1	8	187	1,496
8.	Truck, Fuel, 2000 g	1	12	187	2,244
9.	Suburban, 4x4	1	12	55	660
10.	Truck, Flatbed, 10T	1	12	187	2,244
11.	Truck Tractor w/50T Lowbed	1	12	843	10,116
12.	Grease Unit, Tlr. Mtd.	1	12	12	144
	Total Cost Unit				$ 46,828

EQUIPMENT AUGMENTATION UNIT

LABOR INTENSIVE METHODS

GOJAM PROVINCE

REPAIR PARTS FOR EQUIPMENT

	Equipment Description	No. Units	Months Worked	Cost Month	Annual Cost
1.	Tractor, Crawler, 180 hp	1	8	$ 1,071	8,568
2.	Motorgrader, 125 hp	1	8	300	2,400
3.	Frontend Loader, 1 1/2 cy	1	8	322	2,576
4.	Roller, S.W., S.P., 8-10T	1	8	392	3,136
5.	Crusher, 15 tph	1	8	1,137	9,096
6.	Crusher, 5 tph	1	8	385	3,080
7.	Concrete Mixer	2	8	29	464
8.	Air Compressor w/Tools, 365 cfm.	1	8	166	1,328
9.	Truck, Pickup, 3/4T, 4x4	1	12	50	600
10.	Welder, 300 amp. Tlr. Mtd.	1	8	39	312
11.	Truck, Dump, 5 cm, 4x2	6	8	130	6,240
12.	Truck, Water, 2000 g	1	8	142	1,136
13.	Truck, Fuel, 2000 g	1	12	142	1,704
14.	Suburban, 4x 4	1	12	50	600
15.	Truck, Flatbed, 10T	1	8	120	960
16.	Water Pump, 60 gpm. Tlr. Mtd.	1	8	7	56
17.	Truck, Tractor w/50T Lowbed Tlr.	1	12	428	5,136
18.	Grease Unit, Tlr. Mtd.	1	12	61	732
	Total Unit Cost				$48,224

EQUIPMENT AUGMENTATION UNIT

LABOR INTENSIVE METHODS

GEMU GOFA PROVINCE

P.O.L. FOR EQUIPMENT

	Equipment Description	No. Units	Months Worked	Cost Month	Annual Cost
1.	Tractor, Crawler, 180 hp	1	10	797	$ 7,9[illegible]
2.	Motorgrader, 125 hp	1	10	454	4,540
3.	Frontend Loader, 1 1/2 cy	1	10	401	4,010
4.	Roller, S.W., S.P.,8-10T	1	10	244	2,440
5.	Crusher, 15 tph	1	10	454	4,540
6.	Crusher, 5 tph	1	10	244	2,440
7.	Concrete Mixer	2	10	73	1,460
8.	Air Compressor w/Tools, 365 cfm	1	10	244	2,440
9.	Truck, Pickup, 3/4T, 4x4	1	12	360	4,320
10.	Welder, 300 amp, Tlr. Mtd.	1	10	83	830
11.	Truck, Dump, 5 cm, 4x2	6	10	460	27,600
12.	Truck, Water, 2000 g	1	10	247	2,470
13.	Truck, Fuel, 2000 g	1	10	247	2,470
14.	Suburban, 4x4	1	12	349	4,188
15.	Truck, Flatbed, 10T	1	10	247	2,470
16.	Water Pump, 60gpm, Tlr. Mtd.	1	10	83	830
17.	Truck Tractor w/50T Lowbed	1	12	714	8,5[illegible]
18.	Grease Unit, Tlr. Mtd.	1	12	64	7[illegible]
	Total Unit Cost				$84,354

EQUIPMENT AUGMENTATION UNIT

LABOR INTENSIVE METHODS

GEMU GOFA PROVINCE

TIRES FOR EQUIPMENT

	Equipment Description	No. Units	Month Worked	Cost Month	Annual Cost
1.	Motorgrader, 125 hp	1	10	$ 168	$ 1,680
2.	Frontend Loader, 1 1/2 cy	1	10	1,750	17,500
3.	Air Compressor w/Tools, 365 cfm	1	10	18	180
4.	Truck, Pickup, 3/4T, 4x4	1	12	69	828
5.	Welder, 300 amp. Tlr. Mtd.	1	12	10	120
6.	Truck, Dump, 5 cm, 4x2	6	10	281	16,860
7.	Truck, Water, 2000 g	1	10	187	1,870
8.	Truck, Fuel, 2000 g	1	12	187	2,244
9.	Suburban, 4x4	1	12	55	660
10.	Truck, Flatbed, 10T	1	12	187	2,244
11.	Truck, Tractor w/50T Lowbed	1	12	843	10,116
12.	Grease Unit, Tlr. Mtd.	1	12	12	144
	Total Unit Cost				$54,446

EQUIPMENT AUGMENTATION UNIT

LABOR INTENSIVE METHODS

GAMU GOFA PROVINCE

REPAIR PARTS FOR EQUIPMENT

	Equipment Description	No. Units	Months Worked	Cost Month	Annual Cost
1.	Tractor, Crawler, 180 hp	1	10	$ 1,071	$ 10,710
2.	Motorgrader, 125 hp	1	10	300	3,000
3.	Frontend Loader, 1 1/2 cy	1	10	322	3,220
4.	Roller, S.W., S.P., 8-10T	1	10	392	3,920
5.	Crusher, 15 tph	1	10	1,137	11,370
6.	Crusher, 5 tph	1	10	385	3,850
7.	Concrete Mixer	2	10	229	780
8.	Air Compressor, w/Tools, 365 cfm	1	10	166	1,660
9.	Truck, Pickup, 3/4T, 4x4	1	12	50	600
10.	Welder, 300 amp, Trl. Mtd.	1	10	39	390
11.	Truck, Dump, 5 cm, 4x2	6	10	130	7,800
12.	Truck, Water, 2000 g	1	10	142	1,420
13.	Truck, Fuel, 2000 g	1	12	142	1,704
14.	Suburban, 4x4	1	12	50	600
15.	Truck, Flatbed, 10T	1	10	120	1,200
16.	Water Pump, 60gpm, Tlr. Mtd.	1	10	7	70
17.	Truck, Tractor 2/50T Lowbed Tlr.	1	12	428	5,136
18.	Grease Unit, Tlr. Mtd.	1	12	61	732
	Total Unit Cost				$58,162

LIGHT CONSTRUCTION UNIT
LABOR INTENSIVE METHODS
GEMU GOFA PROVINCE

P.O.L. FOR EQUIPMENT

	Equipment Description	No. Units	Months Worked	Cost Month	Annual Cost
1.	Tractor, Farm, 7t hp, 4x4	6	10	$ 244	$ 14,640
2.	Truck, Flatbed, 5-7T	2	12	282	6,768
3.	Truck, Pickup, 3/4T, 4x4	2	12	361	8,664
4.	Generator, 15 kva	2	12	96	2,304
5.	Water Pump, Stationary	2	12	83	1,992
6.	Water Pump, 60 gpm, Tlr. Mtd.	2	10	83	1,660
7.	Tractor, Crawler, 180 hp	2	10	797	15,940
8.	Motorgrader, 125 hp	2	10	454	9,080
	Total Light Construction Unit				$ 61,048

TIRES FOR EQUIPMENT

	Equipment Description	No. Units	Months Worked	Cost Month	Annual Cost
1.	Tractor, Farm, 75 hp, 4x4	6	10	187	$ 11,220
2.	Trailer, Hydraulic Tipping, 4 cy	8	10	70	5,600
3.	Trailer, Fuel, 750 g, Tlr. Mtd.	2	10	35	700
4.	Trailer, Water, 750 g, Tlr. Mtd.	2	10	35	700
5.	Truck, Flatbed, 5-7T	2	12	188	4,512
6.	Water Pump, 60 gpm, Tlr. Mtd.	2	10	35	700
7.	Motorgrader, 125 hp	2	10	168	3,360
8.	Truck, Pickup, 3/4T, 4x4	2	12	70	1,680
	Total Light Construction Unit				$ 28,472

LIGHT CONSTRUCTION UNIT

LABOR INTENSIVE METHODS

GOJAM PROVINCE

P.O.L. FOR EQUIPMENT

	Equipment Description	No. Unit	Months Worked	Cost Month	Annual Cost
1.	Tractor, Farm, 75 hp, 4x4	6	8	244	11,712
2.	Truck, Flatbed, 5-7T	2	12	282	6,768
3.	Truck, Pickup, 3/4T, 4x4	2	12	361	8,664
4.	Generator, 15 kva	2	12	96	2,304
5.	Water Pump, Stationary	2	12	83	1,992
6.	Water Pump, 60 gpm, Tlr. Mtd.	2	8	83	1,328
7.	Tractor, Crawler, 180 hp	2	8	797	12,752
8.	Motorgrader, 125 hp	2	8	454	7,264
	Total Light Construction Unit				$52,784

TIRES FOR EQUIPMENT

	Equipment Description	No. Unit	Months Worked	Cost Month	Annual Cost
1.	Tractor, Farm, 75 hp, 4x4	6	8	187	8,976
2.	Trailer, Hydraulic Tipping, 4 cy	8	8	70	4,480
3.	Trailer, Fuel, 750 g, Tlr. Mtd.	2	8	35	560
4.	Trailer, Water, 750 g, Tlr. Mtd.	2	8	35	560
5.	Truck, Flatbed, 5-7T	2	12	188	4,512
6.	Truck, Pickup, 3/4T, 4x4	2	12	70	1,680
7.	Water Pump, 60 gpm, Tlr. Mtd.	2	8	35	560
8.	Motorgrader, 125 hp	2	8	168	2,688
	Total Light Construction Unit				24,016

LIGHT CONSTRUCTION UNIT

LABOR INTENSIVE METHODS

GEMU GOFA PROVINCE

REPAIR PARTS FOR EQUIPMENT

	Equipment Description	No. Units	Months Worked	Cost Month	Annual Cost
1.	Tractor, Farm, 75 hp, 4x4	6	10	42	2,520
2.	Trailer, Hydraulic Tipping, 4cy	8	10	4	320
3.	Roller, S.W, Towed	2	10	20	400
4.	Trailer, Fuel, 750 g, Tlr. Mtd.	2	10	6	120
5.	Trailer, Water, 750 g, Tlr. Mtd.	2	10	6	120
6.	Truck, Flatbed, 507T	2	12	102	2,448
7.	Truck, Pickup, 3/4T, 4x4	2	12	50	1,200
8.	Generator, 15 kva	2	12	39	936
9.	Water Pump, Stationrary	2	12	7	168
10.	Water Pump, 60 gpm, Tlr. Mtd.	2	10	7	140
11.	Radio, SSB, 100W	2	12	12	288
12.	Survey Equipment	2	10	15	300
13.	Motorgrader, 125 hp	2	10	300	6,000
14.	Tractor Crawler, 180 hp	2	10	1,071	21,420
	Total Light Construction Unit				$ 36,380

LIGHT CONSTRUCTION UNIT

LABOR INTENSIVE METHODS

GOJAM PROVINCE

REPAIR PARTS FOR EQUIPMENT

Equipment Description	No. Unit	Months Worked	Cost Month	Annual Cost
1. Tractor, Farm, 75 hp, 4x4	6	8	$ 42	$ 2,016
2. Trailer, Hydraulic Tipping, 4 cy	8	8	4	256
3. Roller, S.W., Towed	2	8	20	400
4. Trailer, Fuel, 750 g, Tlr. Mtd.	2	8	6	96
5. Trailer, Water, 750 g, Tlr. Mtd.	2	8	6	96
6. Truck, Flatbed, 5-7T	2	12	102	2,448
7. Truck, Pickup, 3/4T, 4x4	2	12	50	1,200
8. Generator, 15 kva	2	12	39	936
9. Water Pump, Stationary	2	12	7	168
10. Water Pump, 60gpm, Tlr. Mtd.	2	8	7	112
11. Radio, SSB, 100W	2	12	12	288
12. Survey Equipment	2	8	15	240
13. Tractor, Crawler, 180 hp	2	8	1,071	17,136
14. Motorgrader, 125 hp	2	8	300	4,800
Total Light Construction Unit				$ 30,192

EQUIPMENT

AUGMENTATION UNIT

EQUIPMENT

	Equipment Description	No. Units	Unit Cost	Total Cost
1.	Tractor, Crawler, 180 hp	1	105,000	105,000
2.	Motorgrader, 125 hp	1	55,000	55,000
3.	Frontend Loader, 1½ cy	1	58,000	58,000
4.	Roller, S.W., S.P., 8-10T	1	33,000	33,000
5.	Crusher, 15 tph	1	75,000	75,000
6.	Crusher, 5 tph	1	50,000	50,000
7.	Concrete Mixer	2	3,000	6,000
8.	Air Compressor w/tools, 365 cfm	1	36,000	36,000
9.	Welder, 300 amp, Tlr. Mtd.	1	8,500	8,500
10.	Truck, Dump, 5 cm, 4x2	6	31,000	186,000
11.	Truck, Water, 2000 gal	1	42,400	42,400
12.	Truck, Fuel, 2000 gal	1	42,400	42,400
13.	Truck, Flatbed, 10T	1	35,300	35,300
14.	Water Pump, 60 gpm, Tlr. Mtd.	1	1,500	1,500
15.	Truck Tractor w/50 Lewbed Tlr.	1	107,000	107,000
16.	Grease Unit	1	13,500	13,500
17.	Truck, Pickup, 4x4	1	9,000	9,000
18,	Surburan 4x4	1	9,000	9,000
19.	Total Augmentation Unit Cost	24		872,600

Table 4

LIGHT CONSTRUCTION UNIT

LABOR INTENSIVE METHODS

EQUIPMENT

Equipment Description	No. Units	Unit Cost	Total Cost
1. Tractor, Farm, 75 hp, 4x4	6	$ 15,000	$ 90,000
2. Trailer, Hydraulic Tipping, 4 cy	8	4,500	36,000
3. Roller, S.W., Towed	2	4,200	8,400
4. Trailer, Fuel, 750 gal., Tlr. Mtd.	2	5,000	10,000
5. Trailer, Water, 750 gal., T.M.	2	5,000	10,000
6. Truck, Flatbed, 5-7 T	2	24,000	48,000
7. Truck, Pickup, 3/4 T, 4x4	2	9,000	18,000
8. Generator, 15 Kva	2	12,100	24,200
9. Fuel Tank, 5000 gal.	2	2,500	5,000
10. Water Pump, Stationary	2	500	1,000
11. Water Pump, Portable, 60 gpm	2	1,500	3,000
12. Mechanic Tools	4	500	2,000
13. Radio, SSB, 100w	2	1,500	3,000
14. Survey Equipment Sets	2	2,000	4,000
15. Camp Workshop Tools	2	5,000	10,000
16, Tractor, Crawler, 180 hp	2	105,000	210,000
17, Motorgrader, 125 hp	2	55,000	110,000
Total Light Construction Unit	46		$ 592,600

ANNUAL PRODUCTION CAPACITY

RR10 Road		RR30 Road		RR50 Road	
Flat	= 115 kms	Flat	= 89 kms.	Flat	= 63 kms.
Rolling	= 80 kms.	Rolling	= 54 kms.	Rolling	= 44 kms.
Mountainous	= 40 kms.	Mountainous	= 30 kms.	Mountainous	= 25 kms.
Diff. Mount.	= 24 kms.	Diff. Mount.	= 24 kms.	Diff. Mount.	= 20 kms.

MAINTENANCE UNIT

LABOR INTENSIVE METHODS

(TYPICAL)

EQUIPMENT

Equipment Description	No. Units	Unit Cost	Total Cost
1. Motorgrader, 125 hp	2	$ 55,000	$ 110,000
2. Tractor, Farm, 4x4, 75 hp	4	15,000	60,000
3. Trailer, Hydraulic Typping, 4 cy	8	4,500	36,000
4. Trailer, Fuel, 750 gal, Tlr. Mtd.	1	5,000	5,000
5. Trailer, Water, 750 gal, Tlr. Mtd.	1	5,000	5,000
6. Truck, Pickup, 3/4T, 4x4	1	9,000	9,000
7. Truck, Flatbed, 5-7T	1	24,000	24,000
8. Mechanic Tool Set	1	500	500
	19		$ 249,500

Production Capacity

Operating Speed of Motorgrader = 4 km/hr.

To Grade Full Width of Road = Requires 4 passes of grader

Daily Production = $\frac{4 \text{ km/hr} \times 2 \text{ Graders} \times 8 \text{ hr/day}}{4 \text{ passes/km}}$ 16 km/day

Frequency of Maintenance = Every 2 Months

Yearly Production = $\frac{16 \text{ km/day} \times 5.5 \text{ days/wk} \times 48 \text{ wks/yr}}{6 \text{ times/yr}}$

= 704 kilometers per year maintained

Table 6

CONSTRUCTION UNIT

HAND TOOLS

HAND TOOLS

Tool Description	Unit	Quantity	Unit Cost	Total Cost
1. Hand Shovels	EA	500	$ 7.50	$ 3,750.00
2. Pick Axes	EA	300	4.50	1,350.00
3. Hoes	EA	300	5.50	1,650.00
4. Axes	EA	200	14.00	2,800.00
5. Wheel Barrow - heavy duty	EA	100	75.00	7,500.00
6. Machetes	EA	200	2.50	500.00
7. Crowbars	EA	200	12.00	2,400.00
8. Sledge, 1 kg.	EA	100	11.00	1,100.00
9. Sledge, 3 kg.	EA	200	19.00	3,800.00
10. Chisels	EA	200	6.00	1,200.00
11. Screen Mesh	SM	10	100.00	1,000.00
12. Carpentar Tools	Set	5	250.00	1,250.00
13. Blacksmith Tools	Set	5	250.00	1,250.00
14. Handles for above Tools	EA	2000	2.00	4,000.00
15. Water Cans	EA	50	13.00	650.00
16. First Aid Boxes	EA	50	25,00	1,250.00
Total Cost of Hand Tools (First Year)				$ 35,450.00

ANNEX B

ATTACHMENT 2

Technical Assistance

Personnel

Detailed Costing

PERSONNEL

TECHNICAL ASSISTANCE

B. EQUIPMENT SPECIALIST

1. Duty Station
   a. Addis Ababa, Ethiopia

2. Salary — $ 75,953
   a. Base Salary
      $20,254 per year x 3 years = $60,762
   b. Post Differential
      $20,254 x 0.25 x 3 years = $15,191

3. Medical Disability Insurance — 2,400
   a. $800 per year x 3 years = $2,400

4. Education Allowance

   a. $5,750 per child x 2 children x 3 years = $34,500

5. Housing and Living Allowance — 31,090
   a. Quarters Allowance
      $400 month x 34 months = $13,600
   b. Furnishing Allowance
      $5,000 for 3 bedroom house
   c. Guard Service
      $35 per guard x 2 guards x 34 months = $2,380
   d. Storage Allowance
      7,500 lbs x $0.30 lb x 3 years = $6,750
   e. Temporary Lodging Allowance
      $14 day x 4 people x 60 days = $3,360

6. Travel Allowance — 23,406
   a. Travel to post and return
      $1,600 x 4 people = $6,640
   b. Air Freight to post and return
      700 lb for 4 people x $2.09 lb x 2 trips = $2,926

   c. R&R Travel
      $865 x 4 people = $3,460
   d. Incountry Travel
      $20 day x 173 days x 3 years = $10,380

7. Company Overhead — 45,572
   a. $75,953 salary x 0.60 O.H. factor = $45,572

8. Company Profit — 12,153
   a. $121,525 salary + Overhead x 0.10 Profit = $12,153

9. Cost of Employee for 3 years — $225,074

PERSONNEL

TECHNICAL ASSISTANCE

H. Organization and Management Specialist*

1. Duty Station

   a. Addis Ababa, Ethiopia

2. Salary — $ 15,193

   a. Base Salary
      $24,308 per year x 1/2 year = $12,154
   b. Post Differential
      $24,308 x 0.25 x 1/2 year = $3,039

3. Medical Disability Insurance — 400
   a. $800 per year x 1/2 year = $400

4. Housing and Living Allowance ** — 4,400
   a. Quarters Allowance (furnished)
      $600 month x 6 months = $3,600
   b. Guard Service
      $35 per guard x 2 guards x 6 months = $420
   c. Temporary Lodging Allowance
      $14 day x 30 days = $420

5. Travel Allowance — 2,460
   a. Travel to post and return ***
      $1,860
   b. Incountry Travel
      $20 day x 30 days =$600

6. Company Overhead — 9,116
   a. $15,193 salary x 0.60 O.H. factor =$9,116

7. Company Profit — 2,431
   a. $24,306 salary + Overhead x 0.10 Profit =$2,431

8. Cost of Employees for 1/2 year — 34,040

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*For short-term experts dependents will not accompany employee to post.
**To be supplied in lieu of per diem if quarters available.
***Includes first class baggage allowance.

PERSONNEL

TECHNICAL ASSISTANCE

D. PROCUREMENT AND SUPPLY SPECIALIST

1. Duty Station

   a. Addis Ababa, Ethiopia

2. Salary — $ 27,766
   a. Base Salary
      $22,213 per year x 1 year = $22,213
   b. Post Differential
      $22,213 x 0.25 x 1 year = 5,553

3. Medical Disability Insurance — 800
   a. $800 per year x 1 year = 800

4. Education Allowance — 11,500
   a. $5,750 per child x 2 children x 1 year = 11,500

5. Housing and Living Allowance — 16,250
   a. Quarters Allowance
      $400 month x 12 months = 4,800
   b. Furnishing Allowance
      $5,000 for 3 bedroom house = $5,000
   c. Guard Service
      $35 per guard x 2 guards x 12 months = 840
   d. Storage Allowance
      7,500 lbs x $0.30 lb x 1 year = 2,250
   e. Temporary Lodging Allowance
      $14 day x 4 people x 60 days = $3,360

6. Travel Allowance — 9,303
   a. Travel to post and return
      $1,660 x 4 people = $6,640
   b. Air Freight to post and return
      700 lb for 4 people x $2.09 lb = $1,463
   c. Incountry Travel
      $20 day x 60 days = $1,200

7. Company Overhead — 16,660

   a. $27,766 salary x 0.60 O.H. factor = $16,660

8. Company Profit — 4,443
   a. $44,426 salary + Overhead x 0.10 Profit = 4,443

9. Cost of Employee for 1 year — 86,722

PERSONNEL

TECHNICAL ASSISTANCE

F. Trainer for Rural Roads Supervisors*

1. Duty Station
   a. Addis Ababa, Ethiopia

2. Salary — $ 15,193
   a. Base Salary
      $24,308 per year x 1/2 year =$12,154
   b. Post Differential
      $24,308 x 0.25 x 1/2 year = $3,039

3. Medical Disability Insurance — 400
   a. $800 per year x 1/2 year = $400

4. Housing and Living Allowance ** — 4,440
   a. Quarters Allowance (furnished)
      $600 month x 6 months = $3,600

   b. Guard Service
      $35 per guard x 2 guards x 6 months= $420

   c. Temporary Lodging Allowance
      $14 day x 30 days = $420

5. Travel Allowance — 2,460

   a. Travel to post and return ***
      $1,860

   b. Incountry Travel
      $20 day x 30 days = $1,600

6. Company Overhead — 9,116
   a. $15,193 salary x 0.60 O.H. factor = $9,116

7. Company Profit — 2,431
   a. $24,306 salary + Overhead x 0.10 Profit = $2,431

8. Cost of Employees for 6 months — $34,040

*For short-term experts dependents will not accompany employee to post.

**To be supplied in lieu of per diem if quarters available.

***Includes first class baggage allowance.

PERSONNEL

TECHNICAL ASSISTANCE

F. Trainer for Rural Roads Supervisors*

1. Duty Station
   a. Addis Ababa, Ethiopia

2. Salary — $ 15,193
   a. Base Salary
      $24,308 per year x 1/2 year =$12,154
   b. Post Differential
      $24,308 x 0.25 x 1/2 year = $3,039

3. Medical Disability Insurance — 400
   a. $800 per year x 1/2 year = $400

4. Housing and Living Allowance ** — 4,440
   a. Quarters Allowance (furnished)
      $600 month x 6 months = $3,600

   b. Guard Service
      $35 per guard x 2 guards x 6 months= $420

   c. Temporary Lodging Allowance
      $14 day x 30 days = $420

5. Travel Allowance — 2,460

   a. Travel to post and return ***
      $1,860

   b. Incountry Travel
      $20 day x 30 days = $1,600

6. Company Overhead — 9,116
   a. $15,193 salary x 0.60 O.H. factor = $9,116

7. Company Profit — 2,431
   a. $24,306 salary + Overhead x 0.10 Profit = $2,431

8. Cost of Employees for 6 months — $34,040

*For short-term experts dependents will not accompany employee to post.

**To be supplied in lieu of per diem if quarters available.

***Includes first class baggage allowance.

PERSONNEL

TECHNICAL ASSISTANCE

D. PROCUREMENT AND SUPPLY SPECIALIST

1. Duty Station

   a. Addis Ababa, Ethiopia

2. Salary — $ 27,766
   a. Base Salary
      $22,213 per year x 1 year = $22,213
   b. Post Differential
      $22,213 x 0.25 x 1 year = 5,553

3. Medical Disability Insurance — 800
   a. $800 per year x 1 year = 800

4. Education Allowance — 11,500
   a. $5,750 per child x 2 children x 1 year = 11,500

5. Housing and Living Allowance — 16,250
   a. Quarters Allowance
      $400 month x 12 months = 4,800
   b. Furnishing Allowance
      $5,000 for 3 bedroom house = $5,000
   c. Guard Service
      $35 per guard x 2 guards x 12 months = 840
   d. Storage Allowance
      7,500 lbs x $0.30 lb x 1 year = 2,250
   e. Temporary Lodging Allowance
      $14 day x 4 people x 60 days = $3,360

6. Travel Allowance — 9,303
   a. Travel to post and return
      $1,660 x 4 people = $6,640
   b. Air Freight to post and return
      700 lb for 4 people x $2.09 lb = $1,463
   c. Incountry Travel
      $20 day x 60 days = $1,200

7. Company Overhead — 16,660

   a. $27,766 salary x 0.60 O.H. factor = $16,660

8. Company Profit — 4,443
   a. $44,426 salary + Overhead x 0.10 Profit = 4,443

9. Cost of Employee for 1 year — 86,722

PERSONNEL

TECHNICAL ASSISTANCE

H. Organization and Management Specialist*

1. Duty Station

   a. Addis Ababa, Ethiopia

2. Salary — $ 15,193

   a. Base Salary
      $24,308 per year x 1/2 year = $12,154
   b. Post Differential
      $24,308 x 0.25 x 1/2 year = $3,039

3. Medical Disability Insurance — 400
   a. $800 per year x 1/2 year = $400

4. Housing and Living Allowance ** — 4,400
   a. Quarters Allowance (furnished)
      $600 month x 6 months = $3,600
   b. Guard Service
      $35 per guard x 2 guards x 6 months = $420
   c. Temporary Lodging Allowance
      $14 day x 30 days = $420

5. Travel Allowance — 2,460
   a. Travel to post and return ***
      $1,860
   b. Incountry Travel
      $20 day x 30 days =$600

6. Company Overhead — 9,116
   a. $15,193 salary x 0.60 O.H. factor =$9,116

7. Company Profit — 2,431
   a. $24,306 salary + Overhead x 0.10 Profit =$2,431

8. Cost of Employees for 1/2 year — 34,040

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*For short-term experts dependents will not accompany employee to post.
**To be supplied in lieu of per diem if quarters available.
***Includes first class baggage allowance.

PERSONNEL

TECHNICAL ASSISTANCE

B. EQUIPMENT SPECIALIST

1. Duty Station
   a. Addis Ababa, Ethiopia

2. Salary — $ 75,953
   a. Base Salary
      $20,254 per year x 3 years = $60,762
   b. Post Differential
      $20,254 x 0.25 x 3 years = $15,191

3. Medical Disability Insurance — 2,400
   a. $800 per year x 3 years = $2,400

4. Education Allowance

   a. $5,750 per child x 2 children x 3 years = $34,500

5. Housing and Living Allowance — 31,090
   a. Quarters Allowance
      $400 month x 34 months = $13,600
   b. Furnishing Allowance
      $5,000 for 3 bedroom house
   c. Guard Service
      $35 per guard x 2 guards x 34 months = $2,380
   d. Storage Allowance
      7,500 lbs x $0.30 lb x 3 years = $6,750
   e. Temporary Lodging Allowance
      $14 day x 4 people x 60 days = $3,360

6. Travel Allowance — 23,406
   a. Travel to post and return
      $1,600 x 4 people = $6,640
   b. Air Freight to post and return
      700 lb for 4 people x $2.09 lb x 2 trips = $2,926

   c. R&R Travel
      $865 x 4 people = $3,460
   d. Incountry Travel
      $20 day x 173 days x 3 years = $10,380

7. Company Overhead — 45,572
   a. $75,953 salary x 0.60 O.H. factor = $45,572

8. Company Profit — 12,153
   a. $121,525 salary + Overhead x 0.10 Profit = $12,153

9. Cost of Employee for 3 years — $225,074

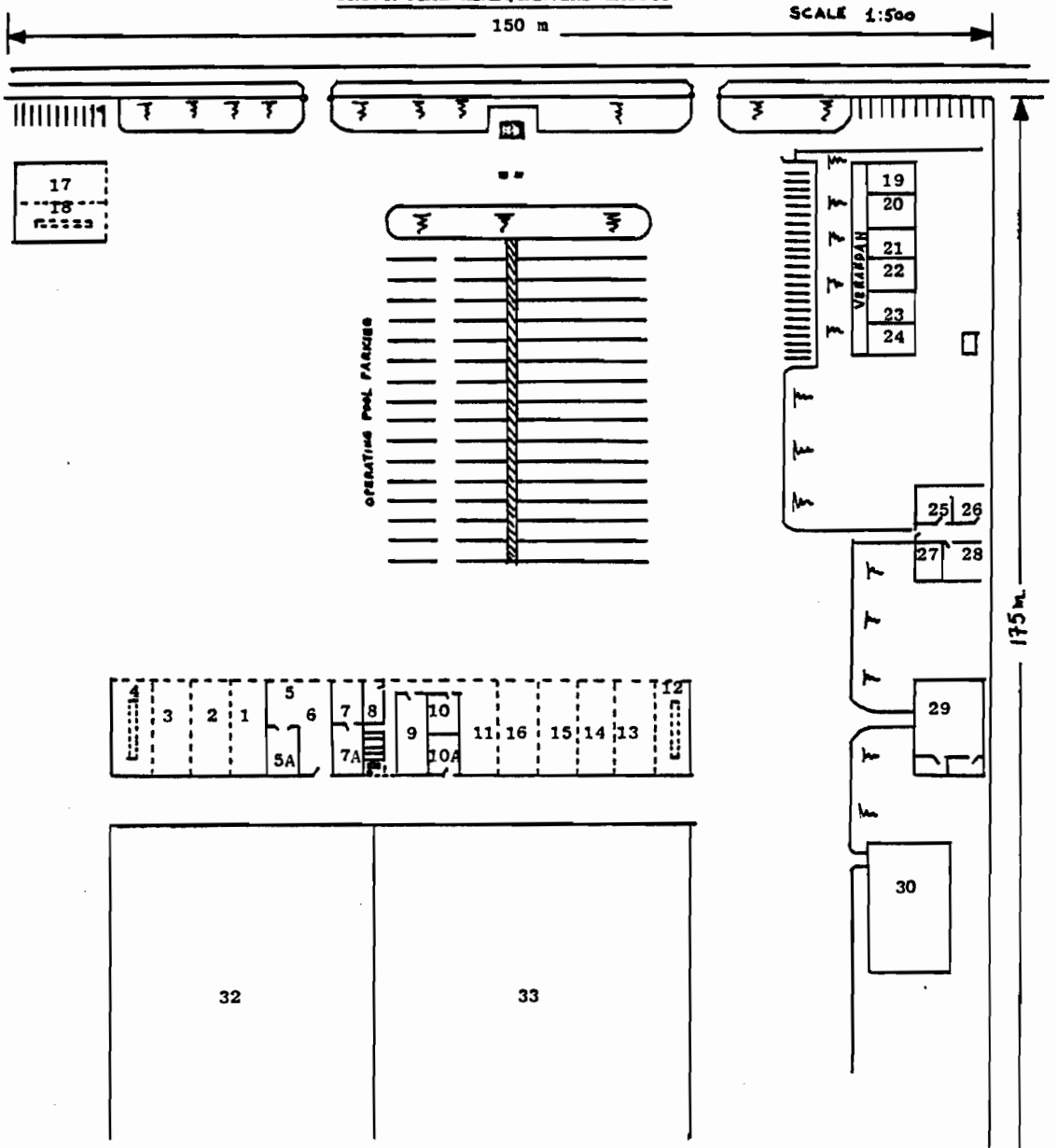
ANNEX B

ATTACHMENT 3

F A C I L I T I E S

ANNEX B ATTACHMENT 3 MAP 1

PROVINCIAL HEADQUARTERS LAYOUT



1,2,3	H/D Rep
4	H/D Inspection
5,5A	Welding & B/S
6	Body Shop
7,7A	Office & Tools
8,8A	Toilet
9	Stores
10,10A	Battery, Electrical & Tire Shop
11	Machine Shop
12	H/D Inspection
13,14,15	L/D Inspection
16	Engine
17	Washing
18	Lubrication
19,20,21,22,23,24	Office
25,26,27,28	Clinic
29	Carpentor's Shop
30	General Store
31	Fuel Station
32,33	Ample Space for Salvage Yard & Deadline Park

Annex B
Attach. 3
Table 1

I. Construction Camp and Offices

	Item Description	Unit	Quantity	Unit Cost	Total Cost
1.	Fencing/Barbed Wire, 5-strand, wooden posts, area 100 x 100 meters	LM	400	$3.00	$ 1,200.00
2.	Well Drilling Casing	EA	1	10,000.00	10,000.00
3.	Water Pump House	EA	1	2,000.00	2,000.00
4.	Water Storage Tank Tower	EA	1	1,000.00	1,000.00
5.	Office and Warehouse, 6 x 12 meters. (Masonary footing, concrete floors, wooden poles, corrugated tin construction)	SM	72	50.00	3,600.00
6.	Living Quarters, one 6 x 20 meters and 12 units 3 x 4 meters (wood poles, corrugated tin construction, dirt floors)	SM SM	120 144	25.00 25.00	3,000.00 3,600.00
7.	Mess Hall, 8 x 6 meters (const. same as No. 6)	SM	48	25.00	1,200.00
8.	Two Bay Workshop with one end enclosed for repair/welding/Electric/tire, etc. 6 x 20 meters. (const. same as 5 above)	SM	120	50.00	6,000.00
9.	Camp Electrical Wiring System	EA	1	3,000.00	3,000.00
10.	Furniture for Camp	LS	1	1,000.00	1,000.00
11.	Miscellaneous	LS	1	1,000.00	1,000.00
	Total Camp and Office Cost				$36,600.00

ANNEX B

ATTACHMENT 4

GUIDELINE SPECIFICATION

SELECT MATERIAL SURFACINGS

SOIL-AGGREGATE SURFACING

I. DESCRIPTION

This work consists of placing a surface course of aggregate on a previously prepared surface, and includes compaction of the materials and finishing to the specified smoothness in reasonably close conformity with the lines, grades, thicknesses, and typical cross sections established by the Engineer.

II. MATERIALS

The selection of surface course materials is governed by gradation. The following table shows the gradings to be used in selecting materials for untreated surface course materials. The grading envelope was arrived at by studies of reports covering the performance of untreated gravel roads. The minimum CBR value of surface course materials is 40. The physical properties given below are to be used for control purposes.

Recommended Gradings

Sieve				Percent Passing
ISO*		ASTM-E11		
19	mm	3/4	in.	100
12.5	mm	½	in.	90-100
9.5	mm	3/8	in.	80-199
4.75	mm	No. 4		55-85
2	mm	No. 10		35-65
425	mm	No. 40		20-40
75	mm	No. 200		15-30

Physical Properties

Criteria	
Design CBR	40
Maximum traffic AESALBD	2×10^6
Maximum LL X (-200)	900
Maximum PI X (-200)	400
Maximum Granularmetric Modulus	580

AESALBD - Accumulated Equivalent Standard Axle Loadings in Both Directions. Granularmetric Modulus-Percent passing 1", 3/4", 1/2", 3/8", 4, 10, 40, 200 - sieves.

*ISO-- International Standards Organization, Geneva, Switzerland.

III. CONSTRUCTION REQUIREMENTS

A. Roadbed preparation:

New Roadbed. After the roadbed has been substantially completed, the full width shall be conditioned by removing any soft or other unstable material that will not compact properly or serve the intended purpose. The resulting areas and all other low sections, holes, or depressions shall be brought to grade with suitable selected material. The entire roadbed shall then be shaped and compacted. Scarifying, blading, dragging, rolling, or other methods of work shall be performed or used as necessary to provide a thoroughly compacted roadbed shaped to the grades and cross sections as staked by the Engineer.

When embankment is to be placed and compacted on hillsides, or when new embankment is to be compacted against existing embankments, or when embankment is built ½ width at a time, the slopes that are 4:1 or steeper shall be continuously benched over those areas as the work is brought up in layers. Benching shall be of sufficient width to permit operations of placing equipment.

Each bench shall be cut as close to the one below as the ground slope will permit, Acceptable material cut out of benches shall be incorporated into the new embankment. Where embankment is to be placed and compacted and end dumping is permitted, the slopes of the original ground or embankment shall be deeply plowed or cut into before starting end dumping. Where an embankment of less than 1.25 meters (4 feet) in thickness is to be made, all sod and vegetables matter shall be removed from the surface upon which the embankment is to be placed, and the cleared surface shall be completely broken up by plowing, scarifying or stepping or a minimum depth of 15 centimeters (6 inches). This area shall then be recompacted. Where the embankment to be placed is greater than 1.25 meters (4 feet) in thickness, the removal of sod is not required

All loose rock or boulders encountered at subgrade in the earth excavation shall be removed or broken off to a depth not less than 30 cm (12 inches) below the subgrade. In excavation areas, the ground shall not be excavated or disturbed below the subgrade except or ordered by the Engineer. All ditches and drains shall be constructed so they will effectively drain the highway before the placement of any surface course material. In no case shall vehicles be allowed to travel in a single track and form ruts.

If ruts are formed, the subgrade shall be reshaped and compacted and any pockets of clay, sand or soft material that may have been left in the subgrade shall be removed and replaced with approved material and properly compacted.

Shoulders. The construction of shoulders shall be by using materials from roadway and borrow excavation, the shoulders shall be constructed to line, grade, and cross section. Completed shoulders shall be true to alinement and grade and shaped in reasonably close conformity with the section. They shall be cleaned of any accumulations, reconditioned as necessary, and maintained until final acceptance.

Previously Constructed Roadbeds. All slide material including culvert inlet and outlet debris, shall be removed and the existing roadbed, shall be scarified, bladed, and shaped to reasonably close conformity with the line, grade and cross sections established by the Engineer. Any high places in the roadbed shall be cut to grade and the resulting material hauled and deposited on a low areas or on fill slopes as directed by the Engineer. Should there remain any depressions or narrow embankments, sufficient approved material shall be obtained and placed to bring the width and/or surface of the roadway in reasonably close condormity with the lines, grades, and cross sections established by the Engineer. The roadbed shall then be rebladed and reshaped. At intersections, the roadbeds of side roads shall be treated similarly, for the distance ordered by the Engineer or as governed by the grading performed, to provide for proper joining of the proposed and existing surface, the roadbed shall be compacted and all work that may be necessary to produce a completed and acceptable foundation shall be performed and the roadbed shall be in this specified condition at the time of placement of any surface course.

Protection of Roadbed. At all times, ditches and drains along the roadbed shall be cleaned and maintained so as to drain if effectively. In no case shall surface course be placed on a muddy, or unstable roadbed not until the roadbed has been checked and approved.

The finished roadbed shall be continuously maintained in a condition suitable for traffic unit the next course, if any, or material is placed or until final completion of the work, as the case may be.

B. Placing:

Surface aggregate material shall be placed on the roadbed starting at a point farthest from the loading source. Material shall be deposited in a uniform manner to insure the planned thickness of each course after compaction. When the required compacted depth of an aggregate surfacing course exceeds 15 centimeters (6 inches), it shall be constructed in two or more layers of approximately equal thickness. The maximum compacted thickness of any one layer shall not exceed 15 centimeters (6 inches). When more than one layer is required, each layer shall be shaped and compacted before the succeeding layer is placed. Placing shall be from vehicles especially equipped to distribute the material in a continuous uniform layer or windrow. The layer or windrow shall be of such size that when spread and compacted, making due allowance for any blending material that is to be added on the road, the finished layer shall be in reasonably close conformity to the required nominal thickness.

When hauling is done over previously placed material, hauling equipment shall be dispersed uniformly over the entire surface of the previously constructed layer, to minimize rutting or uneven compaction.

After material has been placed, the materials shall be mixed while at required moisture content by means of motor graders or other approved equipment until the mixture is uniform throughout.

C. Spreading and Compacting:

When uniformly mixed, the mixture shall be spread smoothly, without segregation, for compaction.

Immediately following final spreading and smoothing, each layer shall be compacted to the full width by means of smooth-wheel power rollers, pneumatic-tired rollers or other approved compaction equipment.

Rolling shall progress gradually from the sides to the center, parallel to the centerline of the road, and shall continue until all the surface has been rolled. Any irregularities or depressions that develop shall be corrected by loosening the

material at these places and adding or removing material until the surface is smooth and uniform. Along curbs, headers, and walls and at all places not accessible to the roller, the material shall be compacted thoroughly with approved tampers or compactors.

A motor power grader or other approved equipment shall be used during the compaction to obtain the specified cross section.

Areas of soft, yielding, or other unsuitable material that will not compact readily shall be removed and replaced.

The surface will be tested for acceptance by the Engineer with a 10-foot (3.05 m) straight edge after the base has been bladed and rolled into a smooth surface.

Any areas where the surface variation exceeds ½ inch (12.70 mm.) in 10 feet (3.05 m) shall be reworked until the variation falls within this limit. Compaction of each layer shall continue until a density of not less than 95 percent of the maximum density determined in accordance with AASHTO T 180 Method D, or other approved method, has been achieved. In-place field density determinations will be made in accordance with AASHTO 191, T 205, or other approved method. The use of AASHTO T 224 to correct for over-sized particles may be required.

The Engineer will make measurements of test holes at random during progress of the work to determine the depth of uncompacted layers required to produce the designated depth of material after compacting to the specified density.

Cutting of the test holes and refilling with materials properly compacted shall be done under the supervision of the Engineer.

ANNEX B

ATTACHMENT 5

PERSONNEL STAFFING

CENTRAL HEADQUARTERS
First Year

PERSONNEL	174		$ 34,093
Labor Classification	**No. Personnel**	**Monthly Salary**	**Total Salary**
I. Directors Office	(3)		($ 1,160)
a. Director, Engineer V	1	$ 655	655
b. Secretary II	1	300	300
c. Clerk Typist II	1	205	205
II. Administrative Division	(46)		(8,789)
a. Division Office	(3)		(970)
1. Division Chief, Clerk V	1	550	550
2. Secretary I	1	260	260
3. Clerk Typist I	1	160	160
b. Personnel Office	(18)		(3,430)
1. Chief, Clerk IV	1	350	350
2. Clerk III	2	240	480
3. Clerk II	4	175	700
4. Clerk I	4	125	500
5. Accountant Clerk II	1	220	220
6. Accountant Clerk I	1	175	175
7. Clerk Typist II	1	205	205
8. Clerk Typist I	2	160	320
9. Claims Advisor	1	240	240
10. Public Relations	1	240	240
c. Fiscal Office	(8)		(1,680)
1. Chief Accountant, Clerk IV	1	350	350
2. Clerk II, Accountant	2	220	440
3. Accountant Clerk I	3	175	525
4. Clerk Typist II	1	205	205
5. Clerk Typist I	1	160	160
d. Supplies	(17)		(2,709)
1. Stock Supervisor	1	320	320
2. Purchasing Clerk II	1	240	240
3. Purchasing Clerk I	2	175	350
4. Expeditor II	1	240	240
5. Expeditor I	2	190	380
6. Clerk Typist II	1	205	205
7. Clerk Typist I	1	160	160

8. Driver	2	72	144
9. Equipment Operator II	2	125	250
10. Equipment Operator I	4	105	420
III. Technical Division	(111)		(20,645)
a. Division Office	(3)		(970)
1. Division Chief, Engineer IV	1	550	550
2. Secretary I	1	260	260
3. Clerk Typist I	1	160	160
b. Evaluation, Research & Inv.	(7)		(1,647)
1. Chief, Engineer II	1	370	370
2. Engineer I	1	280	280
3. Dev. & Trans. Economist	1	240	240
4. Economist/Statistician	1	240	240
5. Clerk Typist II	1	205	205
6. Driver	1	72	72
7. Draftsman/Engineer Aide III	1	240	240
c. Self-Help Schemes	(8)		(1,794)
1. Chief, Engineer II	1	370	370
2. Superintendent I	2	320	640
3. Construction Foreman II	2	240	480
4. Clerk Typist I	1	160	160
5. Driver	2	72	144
d. Survey and Design	(77)		(12,790)
1. Headquarters Office	(10)		(2,744)
a) Engineer III, Design	1	460	460
b) Engineer/Supt. II	2	370	740
c) Geologits	1	370	370
d) Engineer Aide V, Design	1	365	365
e) Engineer Aide IV	1	300	300
f) Clerk Typist II	1	205	205
g) Clerk Typist I	1	160	160
h) Driver	2	72	144
2. Field Survey Crews	(39)		(6,155)
a) Location Engineer III	1	460	460
b) Engineer Aide V, Reg	3	365	1,095
c) Engineer Aide IV	2	300	600
d) Engineer Aide III	5	240	1,200
e) Engineer Aide II	5	150	750
f) Engineer Aide I	14	90	1,260
g) Driver	5	72	360
h) Equipment Operator II	2	125	250
i) Cook	2	90	180

3. Const. Mats., Inv. & Insp.	(28)		(3,891)
a) Engineer Aide IV	3	300	900
b) Engineer Aide III	3	240	720
c) Engineer Aide II	4	150	600
d) Engineer Aide I	9	90	810
e) Driver	3	72	216
f) Equipment Operator II	3	125	375
g) Cook	3	90	270
e. Equipment Division	(16)		(3,444)
1. Chief, Engineer II	1	370	370
2. Equipment Foreman I	2	300	600
3. Inspector/Estimator	1	300	300
4. Clerk II	1	175	175
5. Clerical Aide	2	90	180
6. Clerk Typist II	1	205	205
7. Clerk Typist I	1	160	160
8. Mechanic III	3	300	900
9. Mechanic II	1	220	220
10. Radio Technician I	1	190	190
11. Drivers	2	72	144
IV. Provincial Headquarters Staff	(14)		(3,499)
a. Assistant Director, Engineer IV	1	550	550
b. Engineer III	1	460	460
c. Secretary I	1	260	260
d. Clerk III	4	240	960
e. Expeditor II	2	240	480
f. Expeditor I	2	220	440
g. Clerk Typist II	1	205	205
h. Driver	2	72	144

CENTRAL HEADQUARTERS

Second Year

PERSONNEL	265		$ 52,352
Labor Classification	No. Personnel	Monthly Salary	Total Salary
I. Directors Office	(3)		($ 1,160)
a. Director, Engineer V	1	655	655
b. Secretary II	1	300	300
c. Clerk Typist II	1	205	205
II. Administrative Division	(69)		(13,094)
a. Division Office	(3)		(970)
1. Division Chief, Clerk V	1	550	550
2. Secretary I	1	260	260
3. Clerk Typist I	1	160	160
b. Personnel Office	(21)		(4,005)
1. Chief, Clerk IV	1	350	350
2. Clerk III	3	240	720
3. Clerk II	4	175	700
4. Clerk I	4	125	500
5. Accountant Clerk II	1	220	220
6. Accountant Clerk I	2	175	350
7. Clerk Typist II	1	205	205
8. Clerk Typist I	3	160	480
9. Claims Advisor	1	240	240
10. Public Relations	1	240	240
c. Fiscal Office	(15)		(3,045)
1. Chief Accountant, Clerk IV	1	350	350
2. Accountant Clerk III	1	240	240
3. Accountant Clerk II	4	220	880
4. Accountant Clerk I	6	175	1,050
5. Clerk Typist II	1	205	205
6. Clerk Typist I	2	160	320
d. Supplies	(30)		(5,074)
1. Stock Supervisor	1	320	320
2. Store Clerk II	1	190	190
3. Store Clerk I	2	175	350
4. Purchasing Clerk II	2	240	480
5. Purchasing Clerk I	4	175	700
6. Expeditor II	2	240	480

7. Expeditor	4	190	760
8. Clerk Typist II	2	205	410
9. Clerk Typist I	2	160	320
10. Driver	2	72	144
11. Equipment Operator II	4	125	500
12. Equipment Operator I	4	105	420
III. Technical Division	(167)		(32,498)
a. Division Office	(3)		(970)
1. Division Chief, Engineer IV	1	550	550
2. Secretary I	1	260	260
3. Clerk Typist I	1	160	160
b. Eval. Research & Inv.	(12)		(2,729)
1. Chief, Engineer III	1	460	460
2. Engineer II	1	370	370
3. Engineer I	1	280	280
4. Dev. & Trans. Economist	1	240	240
5. Economist/Statistician	2	240	480
6. Clerk Typist II	1	205	205
7. Clerk Typist I	1	160	160
8. Driver	2	72	144
9. Draftsman/Engineer Aide III	1	240	240
10. Draftsman/Engineer Aide II	1	150	150
c. Self-Help Scheme	(17)		(3,823)
1. Chief, Engineer II	1	370	370
2. Engineer/Supt. II	1	370	370
3. Superintendent I	4	320	1,280
4. Construction Foreman II	4	240	960
5. General Foreman	1	190	190
6. Clerk Typist II	1	205	205
7. Clerk Typist I	1	160	160
8. Driver	4	72	288
d. Survey and Design	(108)		(19,163)
1. Headquarters Office	(17)		(4,791)
a) Engineer III, Design	1	460	460
b) Engineer III, Materials	1	460	460
c) Engineer/Supt. II	3	370	1,110
d) Geologist	1	370	370
e) Photo Interpreter	1	320	320
f) Engineer Aide V, Design	2	365	730
g) Engineer Aide IV	2	300	600
h) Clerk Typist II	1	205	205
i) Clerk Typist I	2	160	320
j) Driver	3	72	216

2. Field Survey Crews	(53)		(8,654)
a) Location Engineer III	1	460	460
b) Engineer Aide V, Reg.	4	365	1,460
c) Engineer Aide IV	5	300	1,500
d) Engineer Aide III	7	240	1,680
e) Engineer Aide II	5	150	750
f) Engineer Aide I	17	90	1,530
g) Driver	7	72	504
h) Equipment Operator II	4	125	500
i) Cook	3	90	270
3. Const. Mats., Invest. & Insp.	(38)		(5,718)
a) Engineer Aide V	2	365	730
b) Engineer Aide IV	4	300	1,200
c) Engineer Aide III	4	240	960
d) Engineer Aide II	4	150	600
e) Engineer Aide I	12	90	1,080
f) Driver	4	72	288
g) Equipment Operator II	4	125	500
h) Cook	4	90	360
e. Equipment Division	(27)		(6,413)
1. Chief, Engineer III	1	460	460
2. Engineer II	1	370	370
3. Equipment Foreman III	1	435	435
4. Equipment Foreman II	1	365	365
5. Equipment Foreman I	4	300	1,200
6. Equipment Inspector	1	365	365
7. Inspector/Estimator	1	300	300
8. Clerk II	1	175	175
9. Clerical Aide	2	90	180
10. Clerk Typist II	1	205	205
11. Clerk Typist I	2	160	320
12. Mechanic III	3	300	900
13. Mechanic II	2	220	440
14. Radio Technician II	1	220	220
15. Radio Technician I	1	190	190
16. Driver	4	72	288
IV. Provincial Headquarters Staff	(26)		(5,600)
a. Assistant Director, Engr. IV	1	550	550
b. Secretary I	1	260	260
c. Engineer III, Reg.	1	460	460
d. Clerk III	4	240	960
e. Expeditor II	4	240	960
f. Expeditor I	6	220	1,320
g. Clerk Typist II	2	205	410
h. Clerk Typist I	2	160	320
i. Driver	5	72	360

CENTRAL HEADQUARTERS
Third Year

PERSONNEL	294		$60,011
Labor Classification	No. Personnel	Monthly Salary	Total Salary
I. Directors Office	(3)		($ 1,160)
a. Director, Engineer V	1	$ 655	$ 655
b. Secretary II	1	300	300
c. Clerk Typist II	1	205	205
II. Administrative Division	(72)		(13,634)
a. Division Office	(3)		(970)
1. Division Chief, Clerk V	1	550	550
2. Secretary I	1	260	260
3. Clerk Typist I	1	160	160
b. Personnel Office	(21)		(4,005)
1. Chief, Clerk IV	1	350	350
2. Clerk III	3	240	720
3. Clerk II	4	175	700
4. Clerk I	4	125	500
5. Accountant Clerk II	1	220	220
6. Accountant Clerk I	2	175	350
7. Clerk Typist II	1	205	205
8. Clerk Typist I	3	160	480
9. Claims Advisor	1	240	240
10. Public Relations	1	240	240
c. Fiscal Office	(15)		(3,045)
1. Chief, Clerk IV, Accountant	1	350	350
2. Clerk III, Accountant	1	240	240
3. Accountant Clerk II	4	220	880
4. Accountant Clerk I	6	175	1,050
5. Clerk Typist II	1	205	205
6. Clerk Typist I	2	160	320
d. Supplies	(33)		(5,614)
1. Stock Supervisor	1	320	320
2. Stock Clerk II	2	190	380
3. Stock Clerk I	4	175	700
4. Purchasing Clerk II	2	240	480
5. Purchasing Clerk I	4	175	700
6. Expeditor II	2	240	480

7. Expeditor I	4	190	760
8. Clerk Typist II	2	205	410
9. Clerk Typist I	2	160	320
10. Driver	2	72	144
11. Equipment Operator II	4	125	500
12. Equipment Operator I	4	105	420
III. Technical Division	(188)		(37,797)
a. Division Office	(3)		(970)
1. Division Chief, Engineer IV	1	550	550
2. Secretary I	1	260	260
3. Clerk Typist I	1	160	160
b. Evaluation, Research & Inventory	(14)		(3,081)
1. Chief, Engineer III	1	460	460
2. Engineer II	1	370	370
3. Engineer I	2	280	560
4. Dev. & Trans. Economist	1	240	240
5. Economist/Statistician	2	240	480
6. Clerk Typist II	1	205	205
7. Clerk Typist I	1	160	160
8. Driver	3	72	216
9. Draftsman/Engineer Aide III	1	240	240
10. Draftsman/Engineer Aide II	1	150	150
c. Self-Help Scheme	(21)		(4,853)
1. Chief, Engineer III	1	460	460
2. Engineer/Superintendent II	2	370	740
3. Superintendent I	4	320	1,280
4. Construction Foreman II	4	240	960
5. General Foreman	4	190	760
6. Clerk Typist II	1	205	205
7. Clerk Typist I	1	160	160
8. Driver	4	72	288
d. Survey and Design	(123)		(22,480)
1. Headquarters Office	(20)		(6,101)
a. Engineer IV	1	550	550
b. Engineer III, Design	1	460	460
c) Engineer III, Survey	1	460	460
d) Engineer III, Materials	1	460	460
e) Engineer/Supt. II	3	370	1,110
f) Geologist	1	370	370
g) Photo Interpreter	1	320	320
h) Engineer Aide V, Design	2	365	730
i) Engineer Aide IV	3	300	900

j) Clerk Typist II	1	205	205
k) Clerk Typist I	2	160	320
l) Driver	3	72	216
2. Field Survey Crews (5-6 man & 3-3 man crews)	(63)		(9,931)
a) Location Engineer III	1	460	460
b) Engineer Aide V, Reg.	4	365	1,460
c) Engineer Aide IV, P.C.	6	300	1,800
d) Engineer Aide III, Inst.	8	240	1,920
e) Engineer Aide II, Inst.	5	150	750
f) Engineer Aide I	21	90	1,890
g) Driver	8	72	576
h) Equipment Operator II	5	125	625
i) Cook	5	90	450
3. Construction Materials, Investigations & Inspect	(40)		(6,448)
a. Engineer Aide V	4	365	1,460
b) Engineer Aide IV	4	300	1,200
c) Engineer Aide III	4	240	960
d) Engineer Aide II	4	150	600
e) Engineer Aide I	12	90	1,080
f) Driver	4	72	288
g) Equipment Operator II	4	125	500
h) Cook	4	90	360
e. Equipment Division	(27)		(6,413)
1. Chief, Engineer III	1	460	460
2. Engineer II	1	370	370
3. Equipment Foreman III	1	435	435
4. Equipment Foreman II	1	365	365
5. Equipment Foreman I	4	300	1,200
6. Equipment Inspector	1	365	365
7. Inspector/Estimator	1	300	300
8. Clerk II	1	175	175
9. Clerical Aide	2	90	180
10. Clerk Typist II	1	205	205
11. Clerk Typist I	2	160	320
12. Mechanic III	3	300	900
13. Mechanic II	2	220	440
14. Radio Technician II	1	220	220
15. Radio Technician I	1	190	190
16. Driver	4	72	288
IV. Provincial Headquarters Staff	(31)		(7,420)
1. Assistant Director, Engr. IV	1	550	550
2. Secretary I	1	260	260
3. Clerk III	4	240	960
4. Engineer III, Regional	4	460	1,840
5. Expeditor II	4	240	960
6. Expeditor I	8	220	1,760
7. Clerk Typist II	2	205	410
8. Clerk Typist I	2	160	320
9. Driver	5	72	360

PROVINCIAL HEADQUARTERS

TYPICAL

PERSONNEL	108	MONTHLY PER. COST $ 17,754

	Labor Classification	No. Personnel	Monthly Salary	Total Salary
I.	Provincial Engineer Office	(4)		(1,127)
	a. Provincial Engineer IV	1	550	550
	b. Secretary II	1	300	300
	c. Clerk Typist II	1	205	205
	d. Driver	1	72	72
II.	Administrative Branch	(24)		(3,127)
	a. Chief, Clerk III	1	240	240
	b. Clerk II, Personnel	1	175	175
	c. Clerk II, Admin	1	175	175
	d. Accountant Clerk II	1	220	220
	e. Accountant Clerk I	2	175	350
	f. Clerk I	2	125	250
	g. Purchasing Clerk II	1	240	240
	h. Stock Clerk II	1	240	240
	i. Expeditor II	1	240	240
	j. Clerk Typist II	1	205	205
	k. Clerk Typist I	3	160	480
	l. Guard	8	30	240
	m. Driver	1	72	72
III.	Equipment Branch	(20)		(2,851)
	a. Chief, Mechanic III	1	300	300
	b. Mechanic II	2	220	440
	c. Mechanic I	2	175	350
	d. Electrician I	1	175	175
	e. Welder II	1	220	220
	f. Machinist II	1	220	220
	g. Serviceman	1	125	125
	h. Tire Repairman	1	90	90
	i. Dresser II	1	175	175
	j. Mechanic Helper	6	90	540
	k. Driver	3	72	216
IV.	Works Branch	(60)		(10,649)
	a. Works Branch Office	(4)		(952)
	1. Chief, Engr./Supt. III	1	460	460

2. Secretary I	1	260	260
3. Clerk Typist I	1	160	160
4. Driver	1	72	72
b. Survey & Design Unit	(5)		(1,150)
1. Chief, Engineer II	1	370	370
2. Engineer Aide III	2	240	480
3. Engineer Aide II, Draftsman	2	150	300
c. Self-Help Scheme Unit	(14)		(2,876)
1. Chief, Engr./Supt. II	1	370	370
2. Superintendent I	3	320	960
3. Foreman II	3	240	720
4. Surveyor/Engr. Aide II	3	150	450
5. Clerk Typist I	1	160	160
6. Driver	3	72	216
d. Maintenance Unit	(2)		(442)
1. Maintenance Supt. II	1	370	370
2. Driver	1	72	72
e. Augmentation Equipment Unit	(35)		(5,329)
1. Chief, Engr./Supt II	1	370	370
2. Operator III	3	150	450
3. Operator II	2	125	250
4. Operator I	9	105	945
5. Mechanic II	1	220	220
6. Mechanic I	2	175	350
7. Mechanic Helper	3	90	270
8. Radio Technician II	1	220	220
9. Superintendent I	2	320	640
10. Foreman General	2	240	480
11. Powerman	1	200	200
12. Welder II	1	175	175
13. Drivers	2	72	144
14. Tire Repairman	1	75	75
15. Equipment Serviceman I	1	75	75
16. Quarry Foreman	1	240	240
17. Electrician I	1	150	150
18. Fuel Boy	1	75	75

LIGHT CONSTRUCTION UNIT

LABOR INTENSIVE METHODS

(TYPICAL)

PERSONNEL

	Labor Classification	No. Personnel	Monthly Salary	Total Salary
1.	Engineer/Supt. II	1	370	370
2.	Superintendent I	2	320	640
3.	Construction Foreman II	4	240	960
4.	Construction Foreman I	4	200	800
5.	Clerk II	2	175	350
6.	Clerk I	8	125	1,000
7.	Account Clerk I	3	175	525
8.	Stock Clerk I	2	175	350
9.	Clerical Aide	12	90	1,080
10.	Expeditor I	2	160	320
11.	Clerk Typist I	2	125	250
12.	Equipment Operator III	6	150	900
13.	Equipment Operator II	6	125	750
14.	Equipment Operator I	3	105	315
15.	Stationary Equip Operator II	2	125	250
16.	Stationary Equip Operator I	4	105	420
17.	Engineer Aide IV	1	300	300
18.	Engineer Aide III	2	240	480
19.	Engineer Aide II	4	150	600
20.	Engineer Aide I	4	90	360
21.	Masonary Foreman	1	200	200
22.	Mason II	4	150	600
23.	Mason I	6	125	750
24.	Carpenter Foreman	1	200	200
25.	Carpenter II	2	150	300
26.	Carpenter I	2	125	250
27.	Mechanic II	2	220	440
28.	Mechanic I	4	150	600
29.	Electrician I	2	150	300
30.	Welder I	2	150	300
31.	Tire Repairman	2	75	150
32.	Driver	5	72	360
33.	Equipment Serviceman I	2	75	150
34.	Time Keeper	8	75	600
35.	Guard II	2	50	100
36.	Guard I	16	30	480
37.	Gang Chiefs	22	50	1,100
38.	Unskilled Labor	440	30	13,200
	Total Unit Cost (Month)	597		$ 31,100

MAINTENANCE UNIT

LABOR INTENSIVE METHODS

(TYPICAL)

PERSONNEL

Labor Classification	No. Personnel	Monthly Salary	Total Salary
1. Superintendent II, Maintenance	1	$ 370	$ 370
2. Labor Foreman	5	200	1,000
3. Clerk I	1	125	125
4. Clerical Aide	2	90	180
5. Equipment Operator III	2	150	300
6. Equipment Operator I	4	105	420
7. Driver	2	72	144
8. Mechanic I	1	150	150
9. Mason I	2	125	250
10. Carpenter I	1	125	125
11. Time Keeper	6	75	450
12. Gang Chief	6	50	300
13. Laborers	120	30	3,600
Total Unit Cost (Month)	153		7,414

I. DESCRIPTION OF PROJECT

Because of a profound lack of access to most rural areas of Ethiopia the Ethiopian Government is now embarking on a large scale, long-term program to construct and maintain low cost, low standard roads throughout the country. These roads will eventually provide farm to market access for millions of Ethiopia's small hold farmers, two-thirds of whom now live more than a half-day's walk from a motorable road.

The Ethiopian Government has made known its intention to request a number of potential donors to provide assistance for the rural roads in specified geographical areas of the country. The U.S. will be asked for assistance in the provinces of Gojjam, Shoa and Gemu Gofa. IDA of the World Bank has been asked to assist in Keffa, Illubabor and Wellega provinces, Sweden in Hararghe, Canada in Begemdir and Tigre and Britain in Wello. The U.S., IDA and Sweden have indicated willingness in assisting. The Canadians are reluctant to assist in the proposed geographic area and the British currently plan no assistance beyond that provided to date.

The Ethiopian Government's rural roads program is described in a document entitled "Highway Sector Program EFY 1970-1974 (1977-1981) Rural Roads Component" dated January, 1977 and prepared by the Ethiopian Road Authority. The five year program calls for the construction of 6,350 km of low-cost, minimum standard rural roads throughout the country during the five year period. In addition the program calls for developing the capability for maintaining 7,900 km of rural roads by 1981.

In the three provinces in which AID will be requested to provide assistance 1,505 kms of rural roads are scheduled for construction during the period. Maintenance is to be provided for 1,931 kms of rural roads by the fifth year of the GOE program.

These rural roads are to be constructed to one of three standards based upon estimates of average daily traffic densities. The majority of the roads are to be built to the lowest standard--RR10 (ADT less than 10 VPD).

a. The RR10 standard roads are to be constructed to the following specifications:

(1) Constructed to minimum standard capable of carrying up to 10 vehicles per day. Closed during the heavy rainy season.

(2) Cleared width: 15 to 20m, depending upon the type of section, sight distance.

(3) Formation width: 6m. But may be reduced to 4m in difficult, mountainous terrain where deep cuts in hard rock would greatly increase costs.

(4) Surface: Imported gravel or similar surfacing not normally provided, but may be necessary over sections of very steep gradient or where soils are particularly poor.

(5) Maximum gradient: 14 percent.

(6) Minimum horizontal curve radius: 10m.

(7) Drainages: Longitudinal drains cut by hand. Cross drainage structures to be of simplest nature, e.g., paved 'drifts' or fords.

(8) Bridges: Not normally provided. Where absolutely essential would generally be timber deck or masonry piers and abutments.

b. The RR30 roads will be constructed to a higher standard than the RR10 standard. They would allow limited wet weather access to light vehicles and would have a normal ADT of 30 vehicles per day.

(1) Cleared width: 15 to 20m.

(2) Formation width: 6m.

(3) Surface: Normally of in-situ sub-grade materials, strengthened, in areas of particularly weak soils, by a layer of selected material over the full formation width. In some locations a layer of 15cm of crushed rock will be applied to the center 3.5m.

(4) Maximum gradient: 12 percent.

(5) Minimum horizontal curve radius: 15m.

(6) Drainage: Longitudinal--as for RR10 roads. Cross drainage to be by means of culverts or paved fords.

(7) Bridges: May be provided at nonfordable stream or river crossings. The cost of a substantial structure will be weighed against the acceptability of periodic temporary interruptions of traffic. When bridges are required the abutments and piers will be of masonry with a minimum top width of 6m. Decks would have a minimum width of 4m. For clear spans of less than 7m they would consist of timber beams and cross-decking, with running boards and/or diagonal planking.

e. The RR50 roads will be all-weather gravel surfaced roads. The standards are identical to the RR30 roads except for the following:

(1) Surface: Normally constructed with a running surface of gravel or crushed rock up to 15cm thick over the full width of the formation. In areas of poor natural subgrade, a subbase course of imported selected material may be required over the full formation width.

(2) Drainage: Cross drainage by means of culverts.

(3) Bridges: Provided at nonfordable stream and river crossings.

The construction of these roads will be the responsibility of a Rural Roads Office, a soon-to-be created semi-autonomous unit of the Ethiopian Road Authority. The RRO will assume and expand upon the current rural roads construction program of the Rural Roads Division of ERA.

The RRO will establish provincial offices in each of Ethiopia's 14 provinces which will be delegated virtually complete authority for selection of roads to be constructed, actual construction and maintenance of rural roads in the province. The provincial rural roads organization will consist of:

(1) A Provincial Rural Roads Office (PRRO) located in the provincial capital responsible for all rural roads in the province.

(2) A Provincial Rural Roads Committee (PRRC) composed of representatives from provincial and awraja (county) development agencies, farmers associations, the Provincial Rural Roads Engineer, and the ERA District Manager. The PRRC is the vehicle for translating the expressed needs of the local populations for roads into a provincial rural roads program. It will draw up the provincial priorities and will settle disputes which might arise.

(3) One or more rural roads construction units will be constituted in each province during the 5-year period. Each unit is composed of equipment, managerial and technically skilled personnel combined with locally recruited unskilled labor. (Approximately 600 unskilled laborers would be required for each unit.)

(4) One or more rural roads maintenance units in each province would be responsible for rural roads maintenance. Like the construction unit, the maintenance units would be as labor intensive as possible. (200 unskilled laborers would be required for each maintenance unit.)

The rural roads to be constructed and maintained by the Rural Roads Organization or for which RRO assistance will be available include: (1) roads associated with drought-prone areas, (2) roads required for Phase II of the Minimum Package Program, (3) roads not included in the above two categories which have been assigned a high priority by the Crown Agents and/or the Ethiopian Government's Rural Roads Task Force, and (4) self-help roads constructed principally by Peasant Associations with assistance from the RRO.

The beneficiaries will be tens of thousands of small peasant farmers and their families who will live within about 10 km of the roads being constructed (or upgraded) and maintained by the Provincial Units being established under this project. The benefits include improved, reduced-cost access to markets for their agriculture production and increased incidence of services such as education, health facilities, agriculture advisory services and improved agriculture input packages, police protection, community development, and delivery of food and medicines to drought affected areas.

The selection of actual roads for construction will attempt to maximize the incidence of benefits delivered by determining priorities based upon numbers of people affected, agriculture potential, current lack of basic services, remoteness in terms of access, planned government rural development programs for the area, susceptibility to drought and the desires of the local Peasant Associations to contribute self-help labor and related inputs.

The AID project will focus on enhancing the capability of the Rural Roads Organization to execute its mandate to construct and maintain rural roads through a to be decentralized organization. AID will assist in expanding the training program to produce the much larger number of skilled and semi-skilled personnel required. AID will also finance the foreign exchange costs of road equipment needed for the provincial construction units in Gojjam, Shoa and Gemu Gofa. AID will provide technical assistance in organizing the equipment maintenance program and the related spare parts ordering and inventory system. AID will assist the Provincial Rural Roads Organizations to be responsive to Peasant Association requests for RRO assistance in their own self-help road building efforts. Finally, AID will cover a portion of the local construction costs of roads built under the Rural Roads Program in the already mentioned three provinces.

The three provinces where AID-assisted road construction and maintenance activities will occur are located in Southern, Western and Central Ethiopia. Geographically, they are extremely diverse ranging from

highly productive grain-growing temperate highlands to low, flat thorn scrub. The predominate agriculture is subsistence farming on small plots with some nomadic pastoralism in areas where rainfall is not appropriate for farming in Gemu Gofa.

The geology and soils of the three provinces is discussed in the Crown Agents' reports for the three provinces. Generally, Gojjam is composed of tertiary trappean lava, quaternary lava with some areas of sandstone and limestone sedimentary deposits. Shoa is similarly composed with some marine and lacustrine sedimentary rock in the Rift Valley lakes area. Large portions of Gemu Gofa are characterized by old crystalline rocks (schists, granite and diorite) with portions of the Omo Valley composed of mud, sand and clay sediments.

Ethiopia, generally, is characterized by excessive soil erosion. It has been estimated that in more than half the country the loss of soil exceeds 2,000 tons per sq. km. The rough estimate for annual soil loss through erosion in Gojjam, Shoa and Gemu Gofa ranges from more than 2,000 tons per sq. km. in virtually all of Gojjam and Shoa down to less than 40 tons per sq. km. in the extreme southern portions of Gemu Gofa.

The area is largely grassland with some tropical woodland and semi-desert thornbush in Gemu Gofa and the Rift Valley in Shoa. The principal food crops grown are maize, sorghum and millet in lower elevations and teff, wheat and barley in the higher elevations. Enset is also an important food staple grown in southern Shoa and much of Gemu Gofa. Oilseeds, coffee and some cotton are also grown. Cattle, sheep and goats are raised throughout the region.

The population density per cultivated hectare ranges between 3 and 7 for Gojjam and Shoa but rises to more than nine persons per cultivated hectare for much of Gemu Gofa.

Of the three provinces it is estimated that the population of Gojjam is 87 percent settled agriculture, 2 percent nomadic and 11 percent urban; in Shoa the corresponding figures are 76 percent, 3 percent and 21 percent; and in Gemu Gofa 88 percent in settled agriculture, 3 percent nomadic and 9 percent urban.

II. IDENTIFICATION AND EVALUATION OF ENVIRONMENTAL IMPACTS

(See Impact Identification and Evaluation Form, Attachment A.)

III. DISCUSSION OF IMPACTS

A. Land Use

1. Changing the character of the land through:

   a. Increasing the population.

The road construction aspect of the project will have a limited and

mostly indirect effect on population. Improved access may bring improved health care which may, in turn, reduce infant mortality and the incidence of endemic diseases. In-migration and/or out-migration is not expected to be influenced significantly by the roads.

b. Extracting natural resources.

There is no anticipation at this time that the roads being built under this project will increase natural resources extraction. There are no known mineral deposits of commercially viable magnitude in the area.

c. Land clearing.

There will be a certain amount of additional land clearing associated with the road construction projects. The total new clearing will be relatively small however because in the majority of cases a trail or track already exists and the roads are being built to minimum standard with only 20m of cleared right of way. It is not considered likely that the rural roads construction and maintenance program will significantly increase or decrease the amount of land cleared for agriculture from the amount that would be cleared in the absence of the program. The roads are being built in already populated areas which tend to be heavily cultivated already. In certain portions of Gemu Gofa, however, if the roads enable the Malaria Control Service to operate more effectively in certain malarial valleys, farmers who currently very intensively cultivate the hillsides will move into the more fertile valleys. The net effect of this downslope movement should prove beneficial however since the lower slopes and valley floors are less prone to severe erosion than are the steep upper hillsides.

d. Changing soil character.

The road program will have a very limited impact here. In some geographic areas of Shoa and Gemu Gofa, the Crown Agents indicated the soil structure was fairly fragile and easily eroded. In these areas the Crown Agents recommended care be taken with drainage and surfacing materials to prevent erosion. This will be done principally by selected material surfacing.

2. Altered natural defense.

The fact that the roads are to be built to minimum standard will help minimize the effect on alternating the natural defenses of the areas. In mountainous terrain however the roads are likely to be natural paths for heavy rain run-off during severe storms. While the low cost nature of the project would preclude costly design modification to entirely alleviate this problem, the project agreement will require that site selection in mountainous terrain take into account this problem and wherever possible to site the roadbed where the road will not contribute to heavy run-off.

3. Foreclosing important and perhaps better uses of the land.

The rural roads program will have no negative impact in this regard. To the extent that better agricultural practices are introduced general land usage practices will be improved.

4. Jeopardizing man or his works because either is put into a zone of potential disaster.

The rural roads program will have little or no negative impact in this regard.

5. Other factors.

a. Borrow pit siting.

Borrow pits will be necessary along certain portions of the roads. They are sited on unproductive land and no agriculture land will be affected. The Project Agreement will stipulate that they must be graded for drainage so that water will not collect. Since in most cases the borrow materials will be needed for periodic road maintenance, the pits will continue to be utilized indefinitely. Their number will be kept to the minimum.

B. Water Quality

1. Physical state of water.

There will be some erosion run-off from these rural roads but the roads are at considerable distance from each other and the cumulative effect in streams, rivers and lakes of the net additional run-off in any geographical area will be minimal. To the extent that the road program, combined with the introduction of other government services, enables farmers to reduce farming of the heavily erodable steep hillsides and to learn better cultivation techniques, the total erosion run-off will be reduced.

2. Chemical or biological states.

The project will have no negative effect.

3. Ecological Balance.

The net effect of the project on the ecological balance of the water supplies of the areas where the roads will be built will be insignificant.

C. Atmospheric

1. Air additives.

None.

2. Air pollution.

During the dry season vehicular traffic over most of these roads will cause dust. This cannot be avoided. However, with average traffic volumes of less than 10 vehicles per day over most of these roads, the problem is insignificant.

3. Noise pollution.

None.

D. Natural resources

1. Diversion, storage or increased use of water.

Road drainage structures will cause minimal diversion of run-off water over short distances. There will be no alteration in major water channels.

2. Irreversible, inefficient commitments.

None.

3. Wildlife.

One road which may be constructed in Gemu Gofa southwest of Jinka passes through a game reserve area. It is anticipated that improved access to this area will increase tourism in the area and will enable better management of the reserve. The net effect of the road on the wildlife should be positive.

E. Cultural

1. Altering physical symbols.

The road construction program consists primarily of up-grading already existing tracks. No physical symbols of any culture are involved.

2. Dilution of cultural traditions.

The road program will undoubtedly create some movement of people into nearby, mostly uninhabited lowland areas but no broad scale movement of

large groups of people into presently settled areas is envisioned or likely. Easier access to markets and increased availability of government services such as education and health are likely to follow in the wake of the road-building program. These changes, while they will undoubtedly affect the lives of the peoples living near the roads, should not provide damaging to cultural traditions since they have not done so in areas where roads have already been introduced.

F. Socioeconomic

1. Changes in economic/employment patterns.

To construct and maintain the roads local labor will be used to the extent possible thus increasing paid employment in rural areas adjacent to the roads. Ethiopian government agricultural programs, especially the Minimum Package Program, Phase II should bring improved agricultural practices to areas up to 10 km on each side of these roads running through MPP areas. Increased production and easier access to markets should lead to increased farmer income.

2. Movement, resettlement or changes in population.

The principal movement of population will probably occur in Gemu Gofa when farmers living on the steep hillsides will be able to move into what are now relatively unpopulated, malaria-infested valleys once the Malaria Control Program has geared up to provide protection. In most of the other areas the increased access created by the rural roads program is not expected to engender large-scale population movements.

3. Changes in cultural patterns.

Changes in traditional Ethiopian cultural patterns are already underway having been greatly speeded up by the Ethiopian revolution, the Zematcha "progress through cooperation" campaign, the development of more than 20,000 Peasant Associations and the beginning of devolution of decision making authority to the provinces and awrajas. This present rural road project will have an insignificant net effect on changes that are already underway.

G. Health

1. Altering or destroying a natural environment.

No natural environment will be changed by this rural roads program.

2. Eliminating an ecosystem element.

No element of an ecosystem will be eliminated or changed by this project.

3. New pathways for disease vectors.

The roads will increase movement of people and agricultural commodities in the areas through which they pass. The chances of human animal and plant disease vectors moving from area to area will be somewhat increased. However increased medical and agricultural services which are to be provided by the government will help minimize these effects.

H. General

1. International impacts.

The project has no international impact.

2. Controversial impacts.

Controversial impacts of the project will be minimal. The selection process has thus far taken into account the desires of representatives of local populations.

3. Larger program impacts.

The rural roads program will assist other development activities such as the Minimum Package Program, Non-Formal Education, Rural Health, etc., to expand their range into currently inaccessible areas. The rural roads program however is only supportive of these other programs and does not form part of these programs. AID assistance is planned for several of these other development programs and the environmental assessment process is being or will be used for the design of these projects.

IV. RECOMMENDATION FOR ENVIRONMENTAL ACTION

On the basis of the information supplied herein it is clearly indicated that the project will not have a significant effect on the environment and it is hereby recommended that a Negative Determination be made.

This project will help provide the capability for provincial-level authorities to construct and maintain low cost, low standard roads which will allow minimal (usually less than 10 vehicles per day) vehicular traffic into large areas of rural Ethiopia currently without such access. As much as possible of the construction will be by hand;

the cleared widths and turning radii will be minimal. There will be minimal earth works; no restrictions or interdictions to animal movement and the roads will be widely dispursed throughout the countryside. There may be very marginal net increases in erosion run-off in mountainous terrain but when compared to the already existing high rate of erosion the increase will be insignificant. To the extent that the roads contribute to farmers moving from the steep hillsides in Gemu Gofa into the valleys erosion may be reduced.

In sum the environmental impact of the rural roads program will be very minimal and supports the recommendation for a Negative Determination.

IMPACT IDENTIFICATION AND EVALUATION FORM

Impact Areas and Sub-areas 1/	Impact Identification and Evaluation 2/
A. LAND USE	
1. Changing the character of the land through:	
a. Increasing the population	L
b. Extracting natural resources	N
c. Land clearing	L
d. Changing soil character	L
2. Altering natural defense	L
3. Foreclosing important uses	N
4. Jeopardizing man or his works	N
5. Other Factors	
a. Borrow Pit Siting	L
B. WATER QUALITY	
1. Physical state of water	L
2. Chemical and biological states	"
3. Ecological balance	N
C. ATMOSPHERIC	
1. Air additives	N
2. Air pollution	L
3. Noise pollution	N

1/ See Explanatory Notes for this form.

2/ Use the following symbols:
- N - No environmental impact
- L - Little environmental impact
- M - Moderate environmental impact
- H - High environmental impact
- U - Unknown environmental impact

D. NATURAL RESOURCES

1. Diversion, altered use of water	N
2. Irreversible, inefficient commitments	N
3. Other factors	
a. Wildlife	L

E. CULTURAL

1. Altering physical symbols	N
2. Dilution of cultural traditions	L
3. Other factors	

F. SOCIOECONOMIC

1. Changes in economic/employment patterns	M
2. Changes in population	M
3. Changes in cultural patterns	L
4. Other factors	

G. HEALTH

1. Changing a natural environment	L
2. Eliminating an ecosystem element	N
3. Other factors	
a. New pathways for disease vectors	L

H. GENERAL

1. International impacts	N
2. Controversial impacts	N
3. Larger program impacts	N
4. Other factors	

I. OTHER POSSIBLE IMPACTS (not listed above)

ANNEX D

MANPOWER ANALYSIS

ANNEX D

MANPOWER ANALYSIS

I. Manpower Requirements

A. Introduction
B. National Roads
C. Rural Roads
D. Summary
E. Conclusion

II. Manpower Supply

A. Introduction
B. Recruitment

1. Professionals
2. Skilled
3. Unskilled

C. Conclusion

III. Manpower Training

A. Introduction
B. Alemgena Training and Testing Center

1. Current Activities
2. Expansion Plan

C. Training Production Units
D. Overseas Training
E. Conclusion

IV. AID Proposal

A. On-the-Job Training
B. Overseas Training
C. Specialized Training Assistance
D. Self-Help Training Program
E. Summary

V. Conclusion

I. Manpower Requirements

A. Introduction

Additional manpower is required for the Ethiopian Road Authority's (ERA) expansion of its national roads operations and staffing of its new Rural Roads Organization (RRO). Requirements for the national roads operations have been determined by the ERA's Planning and Programming Division. Requirements for the RRO are based on the recommendations of the joint Crown Agents/Rural Roads Task Force (RRTF) Study and the experience of the ERA's Rural Roads Division over the past two years.

B. National Roads

Manpower requirements for the national roads, classified by service functions are:

1. Planning and Design Division

Staffing is required for a new unit within this division that will be responsible for evaluation of planned, programmed and budgeted components of the sector program as per the implementation schedule. The unit will also conduct post-construction evaluations of cost over-runs and effectiveness in achieving social and economic goals.

2. Design Division

The present road designing capacity of this division is a maximum 4,000 km. over the next five years. Additional manpower is required to increase the capacity to the 7,800 km. planned in the five year Highway Sector Program.

3. Contract Construction Division

Additional manpower is required to carry out the on-going supervision contracts for the Fifth and Sixth Feeder Roads projects.

4. Operations Division

4,420 km. of roads will be added to the existing maintenance network of 8,867 km. by 1981. This expansion will require an additional eleven asphalt and twenty-four gravel maintenance sections. Manpower requirements for the additional sections are based on ERA standard staffing charts for these sections.

5. Other Support Divisions

Additional staff for the Personnel & Training, Fiscal, Legal, Audit & Methods and Supply & Equipment Divisions is estimated at 8% of the annual requirements for the other national roads divisions.

The summary of the manpower requirements for the national roads is shown in Table 1 of the ERA Manpower Planning Manual. Clerical staff required for the support divisions is readily available so is not shown.

C. Rural Roads

Manpower requirements for the RRO are based on the proposed staffing charts for the Central Head Office, Provincial Head Offices, Constructions Units and Maintenance Units.

The scheduled build-up of Central Head Office staff is given in the ERA Manpower Plan and Development. Provincial Head Offices, Construction Units and Maintenance Units will be phased into operation according to the following schedule:

Fiscal Year	Provincial Office	Construction Unit	Maintenance Unit
1978	1	8	4
1979	2	6	3
1980	5	5	3
1981	4	4	4
1982	2		5
Total	14	23	19

D. Summary

Based on personnel statistics kept by the ERA, normal attrition over the five years of the program is estimated at 5% per year. Table 1 of the ERA Manpower Planning Manual gives the total additional manpower requirements for attrition.

E. Conclusion

The reports, studies and recommendations of the Crown Agents, the Rural Roads Task Force and the ERA have been reviewed by AID engineers and Louis Berger International consultants. It is their belief that eventual adjustment of the standard staffing charts for Provincial Head

Offices, Construction Units and Maintenance Units will be necessary to accommodate the physical and economic differences between the provinces. It is impossible to predict these adjustments at this time. Therefore, the manpower requirements as developed by the ERA are considered reasonable and satisfactory for purposes of the five year Highway Sector Program.

The staffing requirements for the Central Office were developed for a completely autonomous Rural Roads Organization. Now the RRO is planned as a semi-autonomous division of the ERA. As such, it does not need all the duplication of services inherent in the original staffing chart. The revised staffing plan calls for joint EHA-RRO utilization of existing ERA support divisions with capabilities increased by additional staff. In addition, the size of the Central Office will be decreased as technical and administrative staff are transferred to the new Provincial Offices. AID considers the revised plan to be consistent with the objectives of providing adequate support to field units and eventual decentralization of the RRO.

II. Manpower Supply

A. Introduction

The ERA classifies manpower requirements into professional, skilled and unskilled groups.

Professionals are usually university graduates or people with many years of experience. Professional positions in the ERA are engineers, economists, geologists, etc.

Skilled personnel are generally trained in technical, vocational and commercial schools or have experience in ERA or other organizations. Superintendents, foremen, mechanics, electricians, welders, equipment operators, engineering aids, clerks, typists, accountants, etc. are the types of skilled personnel required for the ERA programs.

Because of the labor intensive nature of the rural roads construction and maintenance programs, unskilled laborers comprise over half of the manpower requirements for the ERA five year sector program.

The sources of these laborers will be the farmers associations in the road construction areas.

The ERA plans to acquire all the necessary additional personnel through direct-hire recruitment or promotion of existing staff (who will in turn be replaced by other recruited personnel.)

B. Recruitment

Recruitment is planned to supply most professional and lower level skilled and unskilled personnel.

1. Professional

Most of the professional staff requirements of the ERA are for civil engineers. The sole source of graduating engineers in Ethiopia is the Addis Ababa University. Based on its past experience, the ERA expects to hire at least 25% of the graduating engineers over the next five years for Engineer I and II positions.

This will leave a shortfall of twenty engineers over the five year sector program (see Table 6 of the ERA Manpower Planning Manual). The ERA hopes to attract a greater percentage of the graduating engineers by providing the university with instructors from ERA staff and by arranging a number of summer jobs for civil engineering students. Another source of engineers are those that are currently abroad. By offering to provide transportation back to Ethiopia, the ERA hopes to attract some of these engineers. Finally, the ERA intends to fill any remaining Engineer I and II positions with construction superintendents.

2. Skilled

Skilled clerical, fiscal and administrative staff for lower-level positions will be recruited from students enrolled in the commercial stream of the government senior secondary schools and the private and government vocational commercial schools. Table 5 of the ERA Manpower Planning Manual shows a conservative estimate of the ERA's share of the graduating students from government schools only. No problem in recruiting the required numbers of personnel is anticipated.

Skilled tradesmen such as masons, carpenters and equipment operators will be hired off the local job market. While numbers are usually sufficient, it is possible that certain driver/operator specialities will not be available on a timely basis. A constraint of the number of higher grade driver/operators is the number of years a driver at one grade is required to operate before he is eligible to take examination for the next grade. The ERA believes that the skills necessary for the next grade are achieved in less time than is required and has formally requested the Ministry of Transport and Communications to shorten the requirement. If the regulation is changed, the possibility of any one type of operator not being available will be diminished.

Technicians and mechanics are recruited from the government Technical School of Addis Ababa, Trade School in Asmara and Polytechnic Institute of Bahar Dar and a number of smaller vocational and technical schools. To assure that critical needs such as engineering aids are met, the ERA will encourage its existing personnel to take extension courses to up-grade their education by offering to pay up to 60% of tuition fees. The ERA also feels that the current output of mechanics from vocational and technical schools will be insufficient to meet the total demands of the ERA and other government and private sector programs. They have asked the Ministry of Education to expand the training program for mechanics and their request is being considered at this time.

3. Unskilled

Unskilled laborers will be recruited from local farmers associations. In most areas of construction, supply will be in excess of demand. However, where roads are built through under populated or unpopulated areas, labor will have to be transported from the nearest sources.

C. Conclusion

The ERA has summarized manpower requirements and supply for critical positions in Table 6 of the ERA Manpower Planning Manual. Supply from the university and technical/vocational schools is based on normal graduating class size for these schools. While enrollment in these schools may be as estimated, actual classroom attendance is down. Since school programs for most critical positions are two to four years in length and attendance is down for all years, actual number of graduates will probably be less than predicted for at least two or three years. The ERA's share of the graduates, even with the various incentives it plans to offer, will probably be less than projected. The availability of graduates from the previously non-government schools is even more doubtful. At the same time, the plan to encourage people to return to Ethiopia from abroad is not likely to produce significant numbers of new personnel.

There are two alternatives for accommodating what even in the best of circumstances will be a manpower supply shortage for critical positions:

1. Training can be improved so that less qualified people can fill these positions.

2. The build-up of Central and Provincial Offices and Construction and Maintenance Unit staff can be phased over a longer time period.

The ERA, AID engineers, Louis Berger consultants and a World Bank team have appraised the alternatives. They have concluded that alternative 2 is not feasible if project objectives are to be met. A plan to provide additional and up-graded training has been adapted.

III. Manpower Training

A. Introduction

Most of the additional personnel needed for the road program will require some kind of orientation or intensive training. This will be handled in one of five ways:

1. Orientation through rotational assignments to various divisions in the ERA. Engineers will receive this type of training.

2. Orientation through short term classroom training at the Alemgena Training Center.

3. Longer term training at the center for middle and upper level skilled staff.

4. On-the-job training for lower level skilled staff.

5. Training in institutions abroad for periods of up to one year. Some upper level professional and skilled staff will receive this type of training.

The Manpower Training Needs Table of the ERA Manpower Planning Manual lists additional manpower requirements by position classifications and notes where orientation or intensive training is required.

To achieve the training program, the ERA and World Bank have agreed on a Bank financed expansion of the Alemgena Training Center, establishment of two Training Production Units (TPU's) and overseas training.

B. Alemgena Training & Testing Center

1. Current Activities

The Training & Testing Branch of the ERA was established in September 1956 to up-grade the skill levels of employees engaged in road construction and maintenance activities and to recruit and train new personnel. The formal training and testing center was built at Alemgena, 19 kms. from Addis Ababa on the Jimma road.

The physical plant of the center consists of eleven classroom and office buildings, a four bay garage, a model warehouse, and two dormitories and mess facilities equipped to handle up to sixty trainees at a time. The center has a staff of 38 employees, of which 18 are regular instructors.

During the past twenty-one years, the center has given courses in various fields of highway technology to over 5,000 employees. In addition, the center has trained engineering technicians from the Sudan and has served as the national testing center for all government and private agencies in Ethiopia.

At this time, the technical training at the center consists of the following:

Position	No. of Students	Duration of Course
a. Eng. Aid II	3	4 months
b. Acc. Clerk II	18	2-1/2 months
c. Driver II	5	2 months
d. Operator III	7	1 "
e. Water Truck Operator II	2	1 "
f. Electrician	3	1-1/2 months
g. Roller Operation I	6	1 "
h. Stock Clerk I	6	1-1/2 "
i. Mechanic Helper	1	1-1/2 "
j. Loader Operation III	1	1/2 "
k. Acc. Clerk II	20	3 " (special course)

2. Expansion Plan

a. Training Programs

For the manpower requirements of the five year road program, the center will undertake the training of:

i. instructors for the center and TPU's.
ii. all road supervisors other than foremen grades I, II & III.
iii. engineering aids.
iv. storekeepers.
v. stationary equipment operators.
vi. drivers.
vii. mechanical inspectors.
viii. electricians.

b. Physical Plant

The existing facilities of the center accommodate a maximum of 60 trainees at a time. The proposed training requires facilities for an additional 60 trainees. The ERA plans to add two new dormitories and four new classrooms.

Dormitory area 2x(6mx20m)	= $240m^2$
Classroom area 4x(5mx6m)	= $120m^2$
Total	= $360m^2$

Construction costs are estimated at 350 birr per sq. meter.

Total cost - 350x360 = 126,000 birr

c. Training Aids

Lectures, discussions and demonstrations at the center are supported by visual aids, tools and equipment. A list of the training aids required for the expanded training program is given in the ERA Manpower Plan and Development. The total estimated cost of these aids is 800,000 birr.

d. Food and Lodging

The center provides food and lodging for trainees in the longer term programs. The estimated cost of the extra training is 238,800 birr. The EEC intends to finance these training costs.

e. Instructors

The local staff of 18 instructors will be increased to 27 and a rotation system will be introduced for all staff, including the head of the center. Two of the additional instructors will be experienced maintenance superintendents. They will improve the quality of maintenance operation in the field by rotating among the districts and providing on-the-job training to district foremen. A qualified training specialist will be recruited for one year to supervise the introduction of new courses and the establishment of TPU's.

C. Training Production Units

1. Training Programs

Two TPU's will be established, one for national roads and one for rural roads. TPU activities will cover the training and upgrading of construction, maintenance and quarry foremen grades I, II, and III, equip-

ment operators and drivers, and mechanics grades I and II. Training will be under normal working conditions and while carrying out regular road operations. As trainees complete their programs, they will be assigned to operating units.

The duration of the TPU training cycle for foremen will be 12 weeks, three weeks each in the four main functions of (i) quarrying, (ii) drainage and culverts, (iii) earthworks, operating equipment and vehicles, and (iv) administration.

The TPU training cycle for equipment operators and drivers will be 12 weeks in duration. Each cycle will train 24 operators and 12 drivers. The operators will be divided into six groups of four, two on graders, and one each on dozers, loaders, rollers and tractors. Trainees will have received instruction in preventive maintenance on the six types of heavy construction equipment prior to being assigned to the TPU. The 12 week course consists of 8 weeks of basic training on the specific piece of equipment for which the trainee has been selected, plus 4 weeks learning to operate a second priority piece of equipment. Drivers follow a 12 week course on dump trucks and service trucks and their operation under normal work site conditions.

Each TPU cycle will accommodate 12 grade I mechanics divided into three groups.

Equipment repairs	6
Vehicle repairs	4
Quality control	2

The 24 week course is divided into 16 weeks in an equipment repair workshop, then 4 weeks on vehicle repair and 4 weeks on quality control.

One TPU will be expected to produce the following numbers of fully trained personnel per year:

Civil Engineering Section

Foremen	48
Operators	96
Drivers	48
	192

Mechanical Section

Mechanics	24
Total	216

2. Training Aids

The following equipment will be provided:

One TPU		Total (2 TPU's)
Grader	2	4
Dozer	1	2
Loader	1	2
Roller	1	2
Tractor	1	2
Dump Truck	6	12
Service Truck	3	6

In addition training materials and standard tools will be provided.

3. Instructors

Five qualified instructors will be recruited for two years each for initial supervision of the TPU's: 3 road construction superintendents and 2 mechanical superintendents. A total of 17 Ethiopian technician/instructors will receive instruction from the training specialist at Alemgena and on-the-job training with the TPU's and will take over supervision of the TPU's when the 5 experts depart.

D. Overseas Training

The various divisions of the ERA have projected their requirements for overseas training during the five year road program. Training is recommended for 156 upper level professional and skilled personnel in the ERA Manpower Plan and Development. Final recommendation are made by the ERA General Manager to the government committee responsible for approval all training abroad of Ethiopians.

The World Bank intends to finance the overseas training of about 30 staff from both the national and rural roads operations over the five years of the program. The total cost is estimated at about 400,000 birr.

E. Conclusion

AID considers the ERA-World Bank training plan to provide for most of the additional in-country classroom and on-the-job field training required for the five year roads program. However, a need is seen for on-the-job training of engineering aids, more overseas training of rural roads personnel and a training program for self-help project staff.

IV. AID Proposal

A. On-the-Job Training

The ERA projects a substantial shortage of Engineering Aid II's available from technical/vocational schools and the Alemgena Training Center for the first couple years of the project. AID proposes that this deficit be reduced by hiring students who have failed to graduate and providing them with on-the-job training in the Central Office.

B. Overseas Training

1. Of the overseas training requirements projected by the ERA, AID considers the rural roads training of construction superintendents and engineers the most critical. The candidates for this training have many years of experience in capital intensive highway construction. However, the rural roads program has a completely different objective: labor intensive construction of a lower class road. AID proposes to finance overseas training of nine construction superintendents/engineers per year for three years. Trainees will observe existing labor intensive rural roads organizations in action. Training will be 3 to 6 months in duration. The rural roads organizations in Thailand and the Phillipines are known to be competent in this area and are recommended, but other rural roads organizations can be considered.

Training costs are estimated at $1,250:- per month:
9 trainees/year x 3 years x 6 months/trainee x $1,250/month

= $202,500:-

In addition, AID will finance four 12-18 month training programs in rural roads construction and maintenance management for Ethiopian road engineers who already have 4-6 years of on-the-job experience in Ethiopia. These programs would be on actual projects in other developing countries where rural roads programs are further advanced than in Ethiopia.

Training costs are estimated at $1,250:- per month:
3 trainees for a total of 60 months x $1,250:- = $75,000:-

C. Specialized Training Assistance

1. In order to complete the Alemgena training program for rural roads, AID will fund one instructor in rural roads methodologies for two years. Approximately one half of his time will be devoted to teaching RRO staff on self-help road construction and one half on the regular RRO road program. He will make periodic follow-up visits to actual construction sites and maintenance locations throughout the country to insure that the concepts taught and demonstrated at the training center are actually being put into practice in the field.

2. In addition three short-term trainers will be provided for periods of 3 months each to teach at Alemgena in the following areas: technical report writing, rural road supervision, project cost accounting.

3. Costs for Instructors

a. Long-term: 2 person years x $70,000/yr = $140,000

b. Short-term: 9 person months x $7,500/mo = $ 67,500

Total $207,500

D. Self-Help Training Program

The self-help teams will have little or no experience in self-help type projects. AID proposes to establish a program at the Alemgena Center to train the people selected for these projects. Instruction will include self-help methodology, construction techniques and organization of peasant associations. The course will be 3 months in length. With 3 persons to each team and 3 teams to each province, number of trainees for each year will be:

1978	9
1979	18
1980	45
1981	36
1982	18

The long-term trainer identified in C.1. above will organize and train instructors for the program. Approximately one half of his time

will be spent on the self-help aspect of the training program. In addition, AID will finance necessary training aids.

Instructor

(See 1.c. above)

Training Aids

Classroom materials and visual aids, etc. = $10,000:-

E. Summary of AID Financial Contribution to Training

Overseas Training	$277,500:-
Specialized Instruction	$207,500:-
Self-Help Training Program	$ 10,000:-
Total Contribution	$495,000:-

V. Conclusion

From a manpower analysis point of view, the ERA five year sector program is ambitious, perhaps unreasonably so. Manpower requirements were established before supply was carefully examined. Examination of manpower supply has revealed serious deficits. However, staffing, recruitment, promotion and training plans have been adjusted as best as possible to address these shortages. With the AID and World Bank training proposals, no further serious developments are anticipated. Any staffing shortage that will occur will be during the first year or two of the project and will affect the Central Office, the unit most capable of adjusting to a temporary shortage. Construction and maintenance of rural roads will not be affected by any forseeable manpower shortages.

TABLES IN THE ERA MANPOWER PLANNING MANUAL

Table	Title
1	Five Year Manpower Requirements
2	Five Year Labor Turnover Replacement
2 Supplement	Five Year Pension Plan
3	Five Year Manpower Training Needs
4	Five Year Manpower Recruitment Needs
5	Five Year Manpower Supply Forecast for Essential Occupation/Job Title
6	Matching of Manpower Demand (Recruitment Needs) and Supply

ANNEX E

SOCIAL ANALYSIS

1. Introduction

The social analysis deals specifically with the peoples of Gemu Gofa and Gojjam Administrative Regions--those affected by the rural roads program components being funded by AID. For a broader perspective of the likely affects of development generally on the Ethiopian rural poor reference should be made to Allan Hoben's "Social Soundness Analysis of Agrarian Reform in Ethiopia" (Revised, December 1976) specially prepared for USAID/Ethiopia.

The social analysis of this or any project in present-day Ethiopia is made more than normally difficult by the overriding factor of the ongoing Ethiopian Revolution. The depth and magnitude of changes overtaking traditional Ethiopian society should not be underestimated and as a pervasive, dynamic and on-going force it is rapidly taking Ethiopia--including rural Ethiopia--into directions that largely cannot be charted. The clear implication of this is that the social analysis should be read and employed for whatever purpose with more than normal caution. The situation is considerably more fluid and complex than any such analysis can portray. In this situation, attempting to usefully measure the impact of a single development program--even one as seemingly important as rural roads--on social mores, habits and attitudes of large groups of peoples otherwise being subjected to the winds of rapid change is an exercise verging on the impossible.

Roads, in and of themselves, may be considered a necessary but not sufficient condition for rural development; at least in most of Ethiopia. It would be unrealistic to treat the effects of a rural roads program on change in the absence of (or in isolation from) the many other change factors operating in the rural environment. These include the effects of other Government development and social programs which the expansion of the road network helps spread further to previous inaccessable rural groups. Yet, even the impact on the inhabitants of Gemu Gofa and Gojjam of the total package of Government development packages can only very imperfectly be perceived given the magnitude of the effects of the ongoing revolution.

2. Intended Beneficiaries

a. General

This portion of the social soundness analysis examines the issue of who will benefit from rural roads once they are constructed. It is also necessary to examine how they will benefit from low-standard roads and what additional development inputs are required, if any, to produce these benefits.

The intended beneficiaries of the rural roads are the rural agriculturalists, pastoralists, craftsmen and cottage-industry producers in Gemu Gofa and Gojjam Administrative Regions.

Together with their dependents, this group includes at least 85 percent of the population in these Regions, or about 2.5 million rural dwellers. It is possible to estimate how many of these intended beneficiaries will actually be provided with improved access to vehicle transportation by the rural and self-help roads to be built with the assistance of the projects.

However it implies assumptions concerning an area of influence, the kilometrage of road constructed per annum and the need of the population to use these facilities.

The group which will be affected by the rural road projects already given high priority include some of the poorest and most disadvantaged rural populace in Ethiopia.

In addition to the direct and intended beneficiaries, small traders and merchants will benefit from improved access to rural produce and urban markets. Despite the emphasis of the EPMG on peasant service cooperatives and state participation in the distribution and marketing of agricultural produce and basic consumer goods, the private sector still occupies an important segment of the overall market but its role may diminish as the present time is considered a transition period to Socialism.

The new basic units of local self-government, the Peasant Association, will benefit from rural roads by having easier and thus increased participation in higher level peasant associations and the growing institutions of regional awraja and woreda self-government and coordination of central government programs. The access of associations, through their elected officials, to these higher levels of decision making and resource allocation will strengthen their legitimacy and services to association members.

Despite some questions which are raised herein about the absolute participation basis of peasant associations, for most of the areas dealt with, they represent a much broader participatory base than traditional systems. This is particularly true with regard to inclusion of previously low status groups. The role of women in the new associations is unclear, but provides some immediate improvement of their political participation with possible long range constraints.

How will rural dwellers benefit from improved transportation? In the long run this must occur through increasing rural production--agricultural, livestock products, and crafts or cottage industry products--and the returns which rural dwellers received from their production.

Those peasant agriculturalists who already produce cash crops or marketable surpluses of basically subsistence crops, may receive some increased profit per unit sold if transport is improved. More importantly, rural producers should have more incentive to produce cash crops and surplus if they can be easily marketed. Peasant Associations are established in most of the areas in which the project will exist. Although functioning with quite different degree of effectiveness and representing varied leadership groups within local communities, associations are under pressure and receive assistance to set up service cooperatives. These cooperatives can engage in the establishment of rural cooperative stores--for agricultural inputs and consumer goods, and in the marketing of produce. Similar cooperatives can and are being established by craft and cottage industry groups to purchase raw materials and market their production. These cooperatives will significantly benefit their rural members and can, if they have a large enough membership to contribute capital, expect to contract for bulk transport of goods.

Rural dwellers will, assuming a minimum of public transport on the new roads, enjoy far easier access to urban and town based services, particularly health services. Obtaining improved health services is one of the most frequent reasons stated by rural dwellers for wanting roads.

b. Constraints and Disbenefits

There are no known cultural groups in the potential areas of road construction who oppose the construction of roads per se. There are groups who may oppose roads as a channel for increased government presence in local areas, although these are likely to be few. One of the major causes of this fear is the past pattern of increased alienation of land in newly accessed areas. Assuming that the RRO works effectively with local administration and peasant associations and the new land reform, these problems should be minimized.

The only categories of rural dwellers likely to be immediately harmed by roads are those currently engaged in the transport of goods by animals. In many of the areas in Gemu Gofa and Gojjam those engaged in this form of transport are not from the rural areas they serve. Considering the continued dependence on animal transport in areas with roads, and the scope these transporters have for extending the range of their travels based on the new roads, even these groups should not be seriously harmed for the foreseeable future.

A serious long range disbenefit of roads may accrue to local rural artisans and handicraft producers from the increased influx of cheaper manufactured substitutes for their output. This process is

already occurring in many of the areas in the two regions, and the rural roads program will only accelerate it. The only solution to the problem in the long run is strong governmental support of handicrafts and rural technology appropriate to new demands likely to be generated by mechanization. This would involve the transformation of village blacksmith operations to producing simple agricultural implements. Thus far, some areas of hand production such as weaving of certain types of cloth have held up well throughout Ethiopia, apparently because of cultural preference for traditional items.

The Government's new Handicrafts and Small Industry Development Agency is focussed on just such development. Its funds were recently doubled and it is gradually moving from the planning to the implementation stage of promoting more rural crafts and agriculturally related industries.

Rapidly evolving government policies on state control and intervention in most aspects of the economy may create at least short-term motivation problems in relation to peasant production. Few of the groups in the regions presently appear to have a strong sense of collective motivation and reward. It seems clear that the EPMG plans to shift rewards and motivations to more political and social bases, deemphasizing individual material rewards for production. There may be problems in getting subsistence, family production unit-oriented peasants to accept this new system--at least in the short run. This could seriously impair the production increases and transformations which will be required to significantly accrue benefits from rural roads.

3. Gemu Gofa

a. Socio-Cultural System

Gemu Gofa's population of about one million lives in one of the most varied socio-cultural landscapes found in Ethiopia. The rugged topography of much of the region, reinforced by culturally perceived boundaries, has contributed to the persistence of about 40 separate cultural groups in the region. Some 27 identified languages are spoken by these groups, representing three major linguistic families found in Ethiopia--Omotic, Lacustrine and Sudanic.

Within the socio-cultural complexity, three broad socio-environmental complexes will be dealt with in this analysis. The northern part of Gemu Gofa was, until recently, almost exclusively inhabited by Omotic speaking, highland agriculturalists. Taken as an internally diverse, but related group, this is the largest cultural complex in the region. Almost all of the groups in this area belong to what has been described as the "ensete culture", centered around the strongly sedentary symbolism of this intensively cultivated, slow maturing (about nine years) staple crop.

Recent settling in the lowlands of the north, in the Rift Valley in the east and other valleys in the west, has largely been by agricultural peoples from outside the region. These lowland areas generally offer relatively abundant but not malarial land. The few large commercial farms begun in the region before the revolution were in the eastern lowlands. In both spontaneous and government settlements in these areas, individual holdings frequently average five hectares and above. Where water is available for irrigation, these areas offer considerable agricultural potential. Even without irrigation, the single reliable rainy season offers at least one good crop a year.

The southern highland/lowland complex contains groups in which the traditional distinction between high and low altitude groups pertains but operates less rigidly than in the north. This complex includes exclusively highland groups (the Konso), lowland groups (Tsamai, Geleb, Mursi and Bodi), southwestern groups spanning the two highland zones (the Bako-Gazer, Shangame and Ubamer) and groups which exploit both highland and lowland zones (the Hamer). These groups combine various mixtures of agriculture and pastoralism, many of them in adaptive systems responsive to both ecological and political pressures.

Relationships of trade and somewhat unstable patterns of alliance and conflict exist among many of the southern groups from the Konso in the east to the Geleb in the west. The core of the northern highland groups, the Gemu Gofa and Basketo groups, appear to have little traditional interaction with lowland groups. Despite their strong cultural and linguistic similarities, they appear to have limited interaction across the north-south lowland valleys that divide the major highland complexes of small distinct societies. No major trade routes exist in the region.

Despite recent improvements in access within the region, Felege Neway in the west is generally reached from Arba Minch by going north to Wolayta Soddo and then southwest to Felege Neway. Jinka in the southwest is now reached by going due south to Konso then west below the major highlands. Little long-range movement or trade occurs across the highlands.

b. Socio-cultural Complexes

The Rift Valley area in Gemu Gofa contains increasingly large populations of mixed cultural origins. The largest traditional group in this area is in the Gumaide highland. Other highland groups, from Gemu Gofa, particularly the Otschollo, began settling in lowland areas which they controlled under pressure from the pre-revolutionary government. This process has been accelerated since the revolution because of the need to occupy and till their land in order to retain it. Highland groups from the borders of Gemu Gofa and other regions, the Wellamo and the

Kembatta from Shoa, have begun settling in the area more recently. Galla groups from Sidamo and Shoa have also settled, many of them coming as agricultural laborers to work on the commercial farms established before the revolution. Konso from the south are still found as laborers on several of the now state farms around Arba Minch. Amharas are still present in large numbers in Arba Minch, and other administrative centers in the region.

The predominant culture in this area could almost be termed "contemporary post revolutionary". The ethnic diversity of many of the settlements in this area and its relative accessibility to Arba Minch have supported the ready adoption of peasant associations and other revolutionary organizational forms.

The northern highlands, occupied by related Omotic, ensete cultivating groups, physically includes the northern portions of the two major highland plateaus in Gemu Gofa. The southern part of the eastern plateau is occupied by Gidole (Gardulla) a Lacustrine speaking highland group, who are similar to the groups to the north, but linguistically related to the Konso to their immediate south. A larger area in the south of the western plateau is inhabited by a complex of linguistically distinct Omotic groups related to the Hamer and Dime groups in the southern complex.

The Gemu highlands on the eastern plateau includes numerous small societies occupying areas ranging from 13 to 130 square kilometers. These societies all dwell above 2,000 meters primarily in the Dega zone, and are hoe cultivators of ensete, grains, potatoes and pulses. As with most of the highland societies in Gemu Gofa, groups of ex-slaves and artisans--potters, tanners and smiths--were traditionally excluded from full participation and the latter groups from agricultural activities. Presumably, as the revolution continues, this will change.

The Gemu societies are organized on the basis of overlapping groups based on clans, patri-lineages and neighborhoods. Common named clans occur across societal lines. Leadership of the societies was based on two interdependent, although competing systems. One system was embodied in a hereditary kingship passed through primogeniture in a senior lineage. The kind had both political and ritual responsibilities for the entire society, although the power of the individual king depended on his personal capabilities. The other system was an elected assembly composed of leaders of district assemblies within the society. These assembly leaders were "elected" by the local assembly for a fixed period of time. After completing their term, assembly leaders retained their titles and became members of the assembly. In one area of the highlands it was calculated that about 10 percent of adult male citizens would be likely to be assembly leaders during their lives.

At any given time one of these two systems was usually dominant in a society. In some societies one or the other tended to gain what amounted to permanent dominance, but usually not to the complete exclusion of the other principle. After the conquest of the highlands by Emperor Menelik in the 1980s, kings or Kaos were usually appointed as the local balabats (traditional headmen) in the system of indirect rule used for much of the area by the Amhara.

Except for a few areas in which European missionaries have made inroads, the northern highland societies are generally animistic. Social organization and religion coalesced in the sacrifices made by the senior males in the various social groups on behalf of those in the groups and their dependents. A complex of taboos governed the actions of Gemu societies, and specific spirits or forces were believed to inhabit certain locations and natural objects. A number of ritual specialists sacrificed to locational spirits and attempted to identify and remedy the violations of taboos.

The Zala, living on an isolated ridge between the main eastern and western plateaus, are closely related to the eastern groups and are thought to differ only in minor details from the patterns described above.

The northern groups on the western plateau, the Gofa, Laha, Mallo and Basketo speaking groups are linguistically more removed from the dialects of the east, but socially and culturally similar. It appears that many of these western groups are larger and much less localized than the patchwork of societies in the east. This may however represent the differing degrees to which the areas have been studied by outsiders rather than actual differences. In the view of Amharas, the highland areas are inhabited by undifferentiated groups of Gaminya and Gofaminya speakers. Recent observers of the development of peasant associations in the western highlands have noted the existence of leaders equivalent to both kings and elected assembly leaders. The western societies are also basically divided between citizens and non-citizens, with the same reluctance to allow craftsmen and artisans to till the soil.

The cluster of Ari-Banna (subgroup of Omotic) speaking groups around Jinka in the southern part of the weatern plateau is the southernmost extension of the ensete groups to the north. Occupying primarily the middle highlands in this area, the Bako-Gazer, Shagama, Ubamer and Otha groups are hoe ensete cultivators. The nearby Banna and Karo groups are not ensete cultivators and depend more heavily on pastoralism. The lower areas of the highlands in this area apparently offer enough arable land to allow some shifting cultivation and more fallowing than is possible in the northern highlands.

The southern complex of societies in Gemu Gofa includes interacting groups of highland and lowland agriculturalists and pastoralists. Contiguous from the Konso in the east to the Geleb along the Omo River in the west, this complex is extended to include the Mursi and Bodi tribes in the northern Omo Valley.

The Konso are a distinct ethnic and linguistic group occupying the highland of the same name in the southeast corner of Gemu Gofa. The Konso are linguistically related to the pastoral Arbore to their south, the lowland agricultural Tsamai (Tsamako) to the west, and to the highland Gidole (Gardulla) groups to their north. Although culturally bound to their own highlands as strongly as highland groups to the north, the Konso provide both a cultural and commercial link between highland ensete groups and lowland mixed economy groups.

Within the Konso highlands, the major political unit is the town. Population pressures and the erosion of land have led to the formation of villages in recently settled areas, but these maintain ties to traditional town as focal points of social and cultural interaction. The towns themselves are relatively unique stone walled settlements, densely packed with compounds, alleyways and traditional ritual and social spaces. The Konso have no centralized leadership system, but a proliferation of specific leadership and ritual positions which rotate among members of the society. Kinship is reported to be relatively unimportant in determining both social structural and functional groupings. Town wards and consensually run working groups appear to be the main functional units among the Konso. Konso societies also have non-citizen craft groups present, who were relegated to the same low status as similar groups in other highland societies.

The Konso are known in Gemu Gofa as intensely hard working people, with both men and women participating in the work groups which cultivate the stony, terraced soil of their severely eroded highlands. Sorghum and beans are the main subsistence crops in the highlands, with cotton grown as a cash crop and as a source of raw material for their weaving. To supplement their main field crops the Konso grow a variety of minor crops and trees, which are used as a source of food supplements and beverages.

The Hamar are a southern highland-lowland group, who combine agriculture in both the highlands and, primarily, the lowlands with pastoralism. The Hamer have patrilineages and clans, but elect leaders for the tribe as a whole. Decision making is usually done in public meetings in which all male citizens participate.

The Geleb in the west along the Omo River are primarily pastoralists with some recent dependence on cultivation along the Omo River. The tribe is divided into eight, relatively independent, clans each governed by an age-set structure. Leadership is exercised by the reigning age-set, with

participation or at least influence from complimentary affiliation groups. Clans are ranked in terms of prestige and power.

A number of other tribes are part of this southern complex, spread from the Tsamai along the Woito River in the east to the Bume, Mursi and Bodi in the west. All of these groups practice mixtures of pastoralism and cultivation, with the emphasis in each group depending on the availability of water and conversely, the conditions affecting their herds. Most of these groups are relatively mobile allowing them to shift both cultivation and herds to more favorable areas.

c. Inter-group Relations

Despite the common linguistic and cultural features of the northern highland societies, interaction among these groups is usually limited to societies within contiguous plateau areas. This apparent lack of relations is due to the strong deterent of intervening lowlands, dialectical shifts and to the strongly sedentary orientation of these groups. The only long-range mobility noted among these groups is for the Dorze. This Gemu society has become highly proficient in weaving, and individuals or small groups of men travel out of their home area to weave and market their cloth in other areas of Gemu Gofa and as far as Addis Ababa.

Reports on the Gemu highland indicate that before the Amhara conquest, wars between societies in the area were relatively common. These appear to have resulted from incidents and disputes over border areas which led to the breakdown of treaties between societies. Wars, when fought, were governed by mutually accepted roles which limited the damage to productive resources and loss of life to combatants. In addition to attempting to settle the issue at stake, the motivations in war involved individual and societal prestige and, more prejudicially, the chance to claim part of the labor of families on the losing side for use on one's land.

It appears that relations between the highland societies after the Amhara conquest have been generally peaceful, both within and between main plateau areas. The main interaction for the peasant highlander is participation in the frequent market days held at a number of sites in the highlands.

The ethnic groups who have recently settled in the rural areas of the Rift and the eastern valley are almost all sedentary agriculturalists. Whether in spontaneous government settlements or on large state managed farms, their primary interactions are within their communities, within the structure of peasant associations or cooperatives. To a much greater degree than the groups who have long been incident in the Region, these new settlers are located nearer to and are more dependent on administrative and market towns. These are not long standing patterns of relationships

within the region between the various cultural groups who make up these settlers.

The tribes in the southern complex are interlinked through a variety of relationships. In addition to traditional trade and exchange networks sometimes involving intertwining groups, a number of these groups have long-standing traditions of sharing goods and hospitality. The relationships of cooperation and conflict between groups are reported to be variable, depending on the features of the groups involved.

Generally the relations between agricultural groups or elements of these groups are more peaceful than those between pastoralists. This is in part due to the greater territorial conflicts pastoralists may have in the area and partially to the underlying potential for conflict.

Among the mixed agricultural and pastoral groups in the complex, the situation of the Konso is unique. Maintaining goods trade and exchange relations with most of the groups in the area, the Konso have had their population density problems compounded by attacks from the Borana. These raids have caused the Konso to abondon lands on their borders, which has placed even greater pressure on their already crowded and depleted lands. Efforts to settle some Konso on lowlands within their territory have been complicated by these raids and a lack of roads accessing the settlement areas.

The low level of interaction among northern highland groups living on different major plateau areas has been supported by both topographic and Amhara administrative policies. It is likely that the sense of cultural revitalization in the highlands will lead to increased contacts between essentially similar groups with generally compatible interests. The hierarchy of peasant associations at woreda and awraja levels should provide an acceptable basis for strengthening this new sense of wider class and cultural identity. The peasant association structure, based on administrative units which separate the eastern and western highland areas, will not provide a ready venue for increased contact between these groups. Several of the proposed roads will provide increased access between these areas but the structures and motivations for any significant increase in contact are uncertain.

It appears unlikely that the rural roads, which will provide greater access from the highlands to the lowland administrative and trade centers, will greatly alter relations between the traditional highland societies and the recently settled, culturally heterogenous lowland groups in the north. Supralocal peasant association units cross the highland-lowland division in many areas and should provide a constructive basis for increased mutual cooperation. The main danger of conflict in these heightened zonal contacts may arise out of differing basic needs

and goals of growing urban populations, highly organized state farm and lowland production collectives, and the small farmer on highlands. Administrators, and presumably the Politburo cadres, are aware of these potential urban-rural class conflicts and appeared to be consciously attempting to defuse potential conflicts and work toward better mutual understanding between and among these groups. Roads will both accelerate these problems by increasing contact between highland rural and lowland urban groups while providing rural highland groups with the means to organize their marketing of agricultural production. At the same time increased contact will provide a basis for greater constructive cooperation between highland and lowland groups, making it feasible to work together on common problems and obstacles.

The network of intergroup relations based on trade, politics and mutual dependence and sharing among the groups of the southern complex is likely to be strongly affected by the new system of major drought relief roads already being built in the area. Together with the enlarged arena for intergroup contact and cooperation the establishment of peasant associations will provide, these major east-west roads will have far more impact than the spatially limited rural roads proposed for the area. The latter are essentially access roads providing vehicular access to the main road network from the traditional territories of specific groups such as the Geleb and the Mursi-Bodi or link roads between sections of the main network (Key Afer-Turmi).

These rural roads should improve the ability of the government to provide social services and development assistance to the groups to be accessed without qualitatively altering the changes already underway. The positive effects of these changes will depend heavily on the success of the southern Gemu Gofa Rehabilitation Project in balancing developments among groups in the area in such a way that traditional causes of intergroup conflict are reduced or eliminated.

d. Peasant Associations

The declared intention of the EPMG to establish peasant associations as the basic unit of local government throughout the rural areas of Ethiopia has been implemented with varying success in Gemu Gofa. The current extremes run from socio-cultural groups who have been virtually unaffected because of their isolation and simple economies, such as the Mursi-Bodi, to groups of mixed cultural backgrounds on former commercial farms who have formed producers' cooperatives and effectively collectivized their agricultural resources and efforts. Since these latter groups exist only in the east of the region, and are unlikely to be directly affected by rural roads given their current access to roads, they need not be considered in detail in this analysis.

Official statistics on the registration of peasant associations imply that associations have been formed in most of Gemu Gofa with the exception of southern areas of Geleb and Hamer Bako and Gardulla awrajas. These figures indicate a total of 687 associations in Gemu Gofa with a total membership of 270,354. The membership figures in this registration are internally inconsistent particularly for women. The associations registered probably include some which exist only on paper.

Under the guidance and encouragement of the Zemetcha students, Land Reform agents and Extension Agents, the associations were established on broad-based democratic lines, excluding from membership those who did not actually farm or would not farm. In addition, certain former landlords and other classes were excluded. Attempts to limit the elected leadership of associations to representatives of small or middle peasants met with varying success. In areas of the highlands where associations were formed without opposition, it appears that larger and wealthier farmers tended to be initially elected as officials. These were frequently people who were in, or close to, the pre-revolutionary elites but not at the top. Reports on recent elections of association officials indicate that where the associations have become well established more officials from the lower classes of peasants are being elected.

The scope of responsibilities given to peasant associations has raised some concern about their ability successfully to fulfill all of them. Under the overall authority of the assembly of all members, the association is responsible for electing an Executive Committee, a Judiciary Tribunal, and representatives to the Woreda Peasant Association. In addition, a people's militia force is to be raised, a women's association formed, and services of specific development committees established. Local associations may join with other associations to form service cooperatives, and ideally should establish themselves as a Production Cooperative or collective agricultural units.

Through its various organizations, associations are to be responsible for the building of schools, clinics and roads, the preservation of the environment and the provision of welfare services.

Within the northern highlands, there were a few areas in which strong initial resistance was present to the establishment of associations and the accompanying abolition of landlords, tenancy and hired labor. Kemba Woreda in Gemu Awraja was, and evidently still is, an area where associations are weakly established and continue to face opposition.

In other areas of the northern highlands, the establishment of associations and the implementation of the land nationalization and tenure reform proclamations has proceeded fairly effectively. It is not known how widely traditional social leaders were removed from positions of authority or

excluded from positions in associations. The former balabats were generally excluded from the new associations and their lands, if over ten hectares, were taken over by the new associations. At least in Chencha and Otschollo, the relatively democratic assemblies and assembly leaders were abolished. There are no reports in the Gemu highlands of attacks on the authority or position of respected cultural and ritual leaders by the zemetcha.

Those societies in the highlands that maintained and utilized their systems of local and societal assemblies should have less difficulty in adapting to the participatory nature of peasant associations. The reasonably broad base of traditional participation should also provide an adequate group of potential new leaders. Problems with the new associations in these societies are likely to stem from the proclaimed and implied goals for the associations rather then their form or processes.

Administrative, judicial, development and security functions have been assigned to the associations. It has been reported that associations in both the eastern and western highlands have begun to collectively farm some portion of the associations' lands. In some cases these plots are lands confiscated from former landlords and, in some cases, part of the former communal pastures have been used. Many of these collective plots were established under strong urging from the Zemetcha. Newspaper reports have indicated that several district courts in the region have been closed because of a lack of cases being referred to them from the peasant association judiciary tribunes.

The establishment of peasant associations and the implementation of land reform will continue to have effects on all aspects of life and organization of socio-cultural groups in Gemu Gofa which will far exceed the impact of rural roads. To the extent that peasant associations have been able to absorb the participatory traditions of many of the societies in the region, they have also supplanted these by broadening the base of participation. This has been most significant in the efforts by Zemetcha students and now Politburo cadres to include former low-status artisan groups within the membership of associations.

Most of the artisan groups contained within the highland societies were not allowed to own land or to till the soil. Although legal restrictions were broken down some thirty years ago, little progress was made toward achieving the right to farm by most of these groups. The basic qualification being enforced for membership in peasant associations--actually tilling the soil--presents the artisans with several alternatives. They can either attempt to become full time agriculturalists utilizing what land is available for redistribution by the peasant association, become part-time farmers/part-time artisans and again become members of the

peasant associations, or form their own artisans associations under the auspices of local peasant associations. All three of these alternatives are reported as having been pursued in various areas of Gemu Gofa, some of them meeting with strong local resistance.

Peasant Associations represent a strong base for local decision making, combining the broad based control of local resources with participation in the decision making processes of these resources. Despite their own remaining inequities in the use of land resources, the associations appear to represent a more equitable participatory structure than any of the systems they have replaced. The replacement of traditional structures has, however, also substituted new and culturally uncertain bases of legitimacy for those underlying previous local leadership structures. In addition to their control over the allocation of land, which most peasant associations have not been willing or able to exercise to the extent of carrying out equitable redistribution, local perceptions of legitimacy and efficacy will be improved by the associations' generation and allocation of new resources. Roads represent one way in which the ability of associations to create, deliver and allocate resources in accordance with their goals can be enhanced. Both the value and the need for the instrumentality of peasant associations have been increased by the heightening of expectations which has occured during the three years since the beginning of the revolution.

e. Participation

Peasant Associations in Gemu Gofa are attempting to place decision making powers over the use and allocation of productive resources in the hands of those who physically carry out agricultural production. After the varied and sometimes excessive approaches of the Zametcha students in establishing associations and implementing the basic elements of land reform, those who have subsequently guided the development of associations appear to be taking a more consistent approach. It involves continuing to exclude local leaders whose positions were based primarily on the control of land from positions of authority in the new associations while ensuring the participation of local groups who were most disadvantaged under the previous local systems. Local associations represent effective vehicles for the participation of the majority of peasants in production and development decisions and in the benefits resulting from these decisions.

Initial emphasis during the development of associations has been on including the poorest peasants, landless laborers and tenants, and low-status artisan groups in the membership of associations. The class which has perhaps been most neglected and least helped during this process may be the middle level peasant who was just subsisting before the revolution on a small land holding. Since land has not been

redistributed in most areas, this group has frequently gained little freedom from providing forced labor. On the other hand, it has lost little. This is also the class which probably has the least to gain immediately from the availability of roads unless substantial efforts are also made to improve productivity.

1) Participation of Women

Women as a group have generally been excluded from participation in peasant association decision making unless they are heads of farming households. Together with heads of farming households who are infirm or too old to actually farm, female heads of households are allowed to hire labor to work their land to which they have user rights.

In almost all of the cultural groups in Gemu Gofa, women also work the land and contribute substantially to agricultural production. In groups where the men tend to be seasonably engaged in pastoral activities, women carry out the majority of agricultural work. Among the Dorze, although apparently not in Konso, women contribute to weaving performed by men. Among most groups in the region women are responsible for marketing a large share of the limited produce sold in local markets.

Despite the widespread participation of women in productive activities, they are not direct participants in societal decision making. To put this in perspective it is important to note that in these societies women have traditionally been at least formally dependent on men politically, ritually and economically. Under the structure of peasant associations women are at least theoretically more equal than previously.

Women Politburo cadres have only recently begun to operate in the region and it is perhaps too soon to judge the political effectiveness of women's associations. It seems clear, however, that a relatively gradual approach is being taken to improving the status of women in Gemu Gofa. In most of Gemu Gofa it appears that the productive contribution of women merit more direct political participation than is now allowed them.

2) Mechanisms for Participation

It is obvious from the description of peasant associations that they operate within guidelines and fundamental constraints established by central authorities. It is the nature of democratic centralism that the basic options and directives are centrally determined. Local participatory bodies have the responsibility of examining these directives and, usually, deciding on the basis of local conditions and the best approach and pace for carrying them out.

f. Administrative Reform

The establishment and consolidation of peasant associations had radically altered the sources and distribution of authority in the rural local government. These developments have not, however, led to disappearance of the hierarchy of local administrators in local areas under the jurisdiction of the Ministry of Interior. In Gemu Gofa, as throughout Ethiopia, the last three years have seen great changes in the qualifications sought for administrators and in their approach to their responsibilities. These changes have not altogether undermined the fundamental role of the administrator as the chief representative of the central government's "line ministries" on the local level. The administrator still controls the local police, has administrative (not "technical") control over the operations of other ministries within his jurisdiction, and is generally responsible for the welfare and security of his jurisdictions.

Administrators are no longer in a position to single-handedly bring about or prevent development in their jurisdictions, but their effectiveness and active support is still important to the types of development which must occur if rural roads are to truly benefit the local people.

Within the recent past in Gemu Gofa, administration of the regional (provincial), awraja or woreda levels typically operated out of Amhara enclaves in the culturally alien region. At least in the northern parts of Gemu Gofa, administrative capitals of all these levels were largely towns established by the Amharas, usually as garrisons. In an area with almost no amharic settlements, these towns, surrounded with eucapyltus groves and supporting Christian churches for their Amhara residents, were clear and visible alien implantations. Most of the major towns in Gemu Gofa still have a high percentage of Amharas in their populations. In the south in the densely settled areas, the garrison elements of administrative centers were predominant.

In those times, local administrators had virtually unlimited powers. In addition to serving as transmitters of central government policies and actions, they were able to exact high levels of official and unofficial taxes and tribute from those under their jurisdiction. In many areas of the south, local leaders who cooperated with the Amhara administration could successfully compete for minor administrative posts.

Central Government-initiated changes in the administrative system gradually transformed administrative posts from positions supported by dues from the local population to salaried posts with more restricted authority within the local jurisdiction. These changes supported the development of efforts such as the Awraja Development Committees which carried out some development activities in at least three of the awrajas of Gemu Gofa.

The beginning of the revolution and the implementation of radical land reform was viewed by some in Gemu Gofa as a liberation from oppression enacted by northerners. The pre-revolution administrator's position in this period of rapid changes may have been generally more in sympathy with his fellow northerners and members of classes who previously held positions of authority then with the aspirations of the local people. Although fairly rapid changes were made in administrators at the regional, awraja and woreda levels, it has proven difficult to avoid substituting post-revolution northerners (albeit often more sympathetic to the plight of their rural poor constituency) for pre-revolution northerners.

In several areas of Gemu Gofa where local landlords organized strong resistance to the implementation of land reform, this was done largely from the base of administrative centers. Within these bases landlords were frequently able to enlist at least the passive support of administrators, in some cases post-revolutionary appointees, the police and some elements of the civil service. Most of these centers of resistance have now been overcome by the combined actions of the PMAC, local peasants, and the Zametcha students and Land Reform agents. These incidents of united northern opposition to the changes desired by the local peasants served to confirm long held impressions of the sympathies of administrators.

Newly appointed administrators, which are probably the majority in Gemu Gofa, however socialist and well intentioned, are now faced with an active struggle between new and old power structures at the local level.

The newly instituted Revolutionary Development Committees (RDCs) appear to formalize the coalition of administrators, POMOA (Provisional Office of Mass Organization Affairs) and representatives of mass organizations at the woreda and awraja levels. Although the goals of these bodies stress the defense of the revolution, they also have responsibilities for promoting development, and have powers of imprisonment to deal, among other offenses, with elements who hinder rural productivity.

Administrators and the RDCs can continue to play an important role in facilitating the supply of central government services and resources needed for local development. The RDC is in a particularly critical position to promote the local coordination and balancing of development efforts and external inputs.

g. Social Services

1) Health

An expansion of the services of the Ministry of Public Health in recent years in Gemu Gofa has not begun to meet the needs of the region for

health services. Most of what is offered by the MPH is limited to curative treatment. The MPH is responsible for efforts in preventative services and environmental sanitation, but has lacked the funds or personnel to have any real impact. With the exception of some local statistics compiled by Mission clinics, the only available figures on health conditions come from the Central Statistical Office. For 1974 Gemu Gofa had the highest crude death rate in the country at 23/1000 population; the highest infant mortality rate at 202/1000; and the second highest child mortality rate at 305/1000.*

The Ministry of Public Health supplies the following figures for its health facilities in Gemu Gofa by awraja:

Awraja	Hospitals	Health Centers	Major Health Stations	Health Stations
Gamo	2	2	3	14 + 1 (Mission)
Gardulla	1	0	2	8
Geleb and Hamer-Bako	0	1	0	11
Gofa	0	1	0	7
Total	3	4	5	40 + 1 (Mission)

These figures do not include Mission operated clinics in Konso and Gerese (Gardulla), Omo Rate (Geleb and Hamer-Bako), and Gelta (Gofa). Three additional clinics are operated in Gofa Awraja by the Sudan Interior Mission. These latter clinics have been criticized for their high prices charged for care and their lack of cooperation with the Ministry of Health. The Foster Parents Program was supporting clinics in several settlement areas but its future is now uncertain. The Companie Internationale de Development Rurale, Gemu Gofa Development (CIDR GofaDep) program operating out of Felege Neway is working with peasant associations in the area to train and support basic health workers. This program is being run in accordance with MPH guidelines for such programs as these.

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* National averages for these same indices in 1974 were:

Crude death rate: 15/1000
Infant mortality rate: 155/1000
Child mortality rate: 247/1000

Some of the health facilities included in the MPH's statistics were constructed by peasant associations and Zemetcha students but the number is not known. In addition, the new Rural Project Administration (formerly Ethiopian School Building Unit) has constructed and is planning the following facilities.

Awraja	Completed Health Clinic	Nearing Completion Health Station	Under Construction Health Clinic	Planned Health Station
Gamo	0	5	0	0
Gardulla	0	2	0	0
Geleb and Hamer-Bako	0	2	0	0
Gofa	0	0	1	3
Total	0	9	1	3

Source: RPA Regional Office, Arba Minch.

At least five of the health stations and the one health center in this building program are included in the MPH's figures, apparently representing the replacement of old facilities or facilities already counted as operating by the MPH. Even if taken optimistically, these figures indicate the lack of health facilities in the Gemu Gofa province.

The most frequently mentioned reason for wanting a road in discussions with officials and representatives of peasant associations was access to better health care. In Gemu Gofa, at present, there is no hospital in the western half of the region and many of the lower level facilities lack staff, supplies, and in the west, accessible medical support. Cut off by road for up to eight months, the air service to Jinka and Felege Neway is a sometime affair, with planes currently not servicing these areas for several weeks or more at a time.

Ministry of Health officials are frank to admit that the provision of good health care facilities is currently bound almost entirely to roads. Although their manpower problems have been assisted by the decree that all graduates of medical training institutions in Ethiopia must work for the MPH, it is still difficult to keep good staff and provide logistic and professional support where there are no roads.

The establishment of peasant associations has, so far, not significantly altered the health care situation. Among the responsibilities given to peasant associations is that of assisting the central government in building clinics. The peasant associations also are the logical local structures to carry out sanitation programs, provided that technical support and direction can be given. During the establishment of associations, one of the categories of traditional authority figures which was attacked in some areas was traditional healers. How much of this traditional, but locally available, source of health care was weakened by these attacks is not known.

Combined with the increased demand for progress and services in health, as well as other areas, the weakening of the traditional health care sector has enlarged a growing and strongly felt vacuum.

The strong orientation of the Ministry of Public Health towards the establishment of a basic health care system utilizing more para-professionals, will be greatly benefited by the provision of access roads. Such a system requires that support and supervision can be provided to local level workers. While it is feasible, with adequate motivation, to provide this support in areas requiring several days walking to reach posts, it is considerably more effective and cost effective in terms of utilizing manpower to provide support in areas accessible by road.

2) Education

Until quite recently Gemu Gofa, along with many other regions, had only one senior secondary school. When the capital of the region was moved from Chencha to Arba Minch in 1963, the senior secondary school was moved as well. As with many of the other amenities and services of the essentially Amhara towns, the senior secondary school moved with the administrators.

The Ministry of Education reports that in 1976 Gemu Gofa had a total of 80 elementary schools, 8 junior secondary schools and 3 senior secondary schools. There were an additional five mission elementary schools and two private elementary schools.

The Rural Projects Agency (RPA) has a total of 32 schools in its 1976/77 construction program. By March of 1977 some 25 of these projects, 21 elementary, 2 junior secondary and 2 senior secondary schools were either completed or under construction. This program has built schools in quite remote areas of the region, including two elementary schools in locations which required the peasants in

the area to carry the materials in from Arba Minch. Nonetheless, of its total program 50 percent of the projects were in Gemu Awraja and an additional 25 percent in Gardulla Awraja.

This should not conceal the fact that in the remaining 25 percent two were senior secondary schools (one in Felege Neway and Jinka), the only two in the program. This distribution does partially support the widely held view in the region that educational facilities will follow roads.

Peasant Associations have built some schools in the region, both with and without the assistance of Zemetcha students. Associations have also contributed labor and materials to the RPA built schools. Recent proclamations have given local communities a role in the administration of schools as well as their construction by establishing community committees to work with the government heads of schools. The main obstacle to the proliferation of at least minimal self-help schools has been the lack of qualified teachers. This again is an area where school administrators stressed the value of roads in helping to keep good teachers in relatively remote posts.

The overall reaction to education with a national emphasis in Gemu Gofa is ambivalent. There is a strong sense of cultural revitalization which has emerged from the liberation from an Amhara government and administration. This has led to some increased feelings about Amharic-oriented education. This same sense of cultural revitalization has also led to a strong emphasis on the need for administrators and government officials from local areas. The emphasis has reportedly led to the removal or transfer of some woreda administrators, largely on the grounds that they were outsiders. It is desired that members of local groups occupy these positions, but this requires more stress on education of local youth in such a way that they can function effectively within the national culture which is now emerging.

However, this issue is resolved in the minds of local people. There seems to be an increased desire for schools in most areas of Gemu Gofa. The extent to which the Ministry of Education will be able to supply qualified teachers to fill these needs remains to be seen. The Ministry of Education appears to be attempting to expand educational facilities, but there is likely to be a lack of teachers, particularly teachers acceptable to increasingly culturally and politically aware local communities. The shortage of teachers, especially at higher levels, will not be helped by the disruptions which have occured in the colleges and training institutes throughout the country. Most of these institutions were closed for almost two years and many are still operating with about one-half of their normal students.

h. Summary - Gemu Gofa

The net effect of the rural roads program in Gemu Gofa is likely to be substantial in accelerating trends already underway. The new political organizations based around the peasant associations are already in place and will continue to spread with or without the roads. The road program will however affect the rate of expansion of these political changes particularly the links between lower and higher levels of representation. Socially and culturally, Gemu Gofa is already experiencing profound changes. Yet the area has not been static or changeless for at least the last eighty years--since the expansionist policies of Menelik first brought the area under Amhara hegemony. The 1974 revolution which, if anything, is gaining momentum, is introducing new social relationships and new roles to the rural population.

The Government is preparing, and in some cases is already embarked upon new development programs which will affect Gemu Gofa. These include the agriculture Minimum Package Program, improved grain storage and marketing, adult education, and an expanded rural health delivery system. The roads program will obviously facilitate the expansion of these activities to more people.

In addition, given the susceptibility of the province to recurrent drought, improved access will enable the Government to respond to future food and medical relief needs more quickly than in the past. (During the 1974 drought, food had to be airdropped in the more remote areas of north-central Gemu Gofa.)

4. Gojjam

a. General

The area of Gojjam to be affected by the RRO during the life of this project is inhabited by a single cultural group--Amharinya speaking, Ethiopian Christian, plow agriculturalists. Within the population of approximately 1,200,000, included in this group there are obviously variations but they are relatively minor variations on a strongly established theme.

The socio-cultural system in Gojjam is typically described in relation to three central, interrelated complexes. Highland plow agriculture, the traditional military-political hierarchy of lords and nobles, and the Ethiopian Christian Church. These properly refer to a period and a system of powers and rewards which is now passed. In a sense, Gojjam appears to be a system overdue for change, operating at least on the local rural level in terms of institutional structures which no longer represent the forces they once were. The rural socio-cultural system

is involved in an on-going and reluctant process of adapting to changes within these three institutions and to the intrusion of new institutions of contemporary relevance.

Scattered throughout the region are dispersed household compounds of from one to six mud and wattle huts. From these compounds, the surrounding fields, and sometimes fields cultivated in differing micro-climatic zones nearby, are farmed with the use of a plow and oxen. There are generally no traditional nucleated settlements and the towns found scattered in Gojjam are the product of the central government's administrative and policing requirements.

The rural peasant lives within four differently bounded unities; a household production and consumption unit, a kinship defined by land division, a geographically bounded parish centered on an Ethiopian Christian Church, and the area of a gult, a grant of rights and responsibilities over the unit of land in the traditional political structure.

Households are made up of a group of near and sometimes distant relatives of the male head perhaps together with some non-kinsmen. Under the authority of the household head, this unit carries out the production, consumption and trading of food and the maintenance of the household's dwellings and equipment. The size of the household, more often than not, is in keeping with land resources available for its exploitation. The household members are assigned tasks by the head according to normally strict divisions by age and sex.

Land can be claimed by any freeborn male through either male or female lines in any land division within which he can trace descent to the person originally granted the division. An individual can only claim rights of community participation within the land unit in which he actually lives. Due to the workings of the land use right system used to allocate land among claimants, a man's fields will be scattered within the land division in which he lives and, in many cases, in other land divisions.

Each land division lies within a parish, a social unit owing obligations to the church or the parish. Parishes range in size from about 60 to several hundred households. Each household owes minimal obligations to the parish church from contributions of grain for communions to providing support for special activities and contributions of labor and materials for the repair or improvement of the church. Other households using land requiring special obligations to the church, support the masses performed every Sunday and on special occasions throughout the year.

Rights over a local unit of land, part or all of a parish, were traditionally possessed by local rulers on the temporary grant of a higher ruler or lord. These grants, which at least in theory originated with the Emperor, included judicial, tributory and corvee labor rights over the granted unit. Grants of local units were made by higher ranker's grantees who in turn owed their rights to still higher lords. In both symbolic and real senses, a hierarchy in which pragmatic subordination and tribute flowed up existed from the members of a family through the male head reaching up ultimately to the emperor.

What has perhaps sustained this system based on rigid hierarchical and individualized relationships is that each of its components--household, land rights, political position and church hierarchy--is based, at least theorectically, on open recruitment. Although in practice some hereditary successions to positions occurred, all freemen could, and at times did, move both up and down in the system. Some advancements occurred by chance or recognition of bravery or daring. More often an ambitious and talented man could work within all these systems to increase his wealth, power and control over other men.

As denoted by the use of the term freemen, there are groups within Amhara areas with distinctly inferior status. These are ex-slaves and occupational specialists such as artisans. Slaves were from non-Amhara groups and were attached to households or to the establishments of grant men. Slaves no longer exist legally and many of those of similar racial types have been assimilated into the Amhara population. Many former slaves remain attached to their former master's households.

Artisan groups--weavers, tanners and smiths--are relegated to a low status and their interaction with the rest of society is restricted. The three groups variously combine in endogenous groups in different areas of Gojjam and usually live in occupation-specific settlements in particular areas of Amhara hamlets. There were restrictions on eating and interacting with these groups before the revolution. These groups did not own land but would frequently be able to cultivate small plots rent-free in return for providing free services to the gult-holder of their area. This is one of the groups which would benefit, in time, from the new land reform.

These occupational groups are Ethiopian Christians and speak Amharic. Once free of their known social indentities in rural areas, they are frequently able to improve their status in towns and cities.

b. Role of Women in Gojjam

Women play no roles of authority in any of the complexes discussed. Within the household women are almost entirely excluded from agricultural production activities and expected to devote their lives

to largely domestic duties. Women have traditionally managed garden plots, cultivated them and been involved in trading or selling some of the garden produce in local markets. Even in this role, however, women's independence has been a source of concern and suspicion to Amhara men.

Use-rights to land can be claimed through female ancesters, but women cannot themselves activate claims or apparently retain use-rights without the intervention of males. In this sense, women are carriers of land rights, not activators.

In religious activities, women are devoted worshippers and followers of the church but play no major roles in formally celebrating the masses and other rituals in parish churches. Women also have no positions in the hierarchy of the church in Ethiopia.

So far as is known, Amhara women played no formal roles in the traditional political system and could not aspire to any part in decision making.

As summarized by one observer of Amhara culture, "The Amhara peasant woman's lot is as hard as that of a slave. In the wealthier families, where domestic drudgery is relieved by servants, she must still be a passive, reserved nonentity." 1/

c. Peasant Associations

The Proclamation establishing peasant associations and implementing land reform came at a time when many of the northern regions were already uneasy about the new government in Addis Ababa. Although the land reform measures in the Proclamation of April, 1975 were modified for rist (communal) tenure areas, the volatile situation in Gojjam quickly developed into a number of armed uprisings, most notably in the areas around Motta. The Zemetcha students in Gojjam apparently remained close to the major towns and did not stray too far from roads. The results of their efforts to establish peasant associations were meager, even on paper. By September, 1975 the Ministry of Land Reform and Administration claimed 138, 4 and 1 associations for Debre Markos, Kola Dega Damot and Motta Awrajas.

Figures from the Ministry of Agriculture and Settlement in April, 1977 are somewhat more optimistic but are probably greatly inflated. They show 2,454 associations with a total membership of 378,113.

1/ Donald Levine, Wax and Gold, p. 78

Registered Peasant Associations in Gojjam by Awrajas, 1977

Awrajas	No. Peasant Associations	Membership
Agew Midir	358	37,115
Bahar Dar	499	76,465
Bichena	76	13,568
Debre Markos	525	102,241
Kola Dega Damot	608	104,192
Motta	388	45,532
Total	2,454	378,113

Source: Ministry of Agriculture and Settlement Office, Debre Markos

These figures are based on the efforts of EPID extension agents and Land Reform agents made throughout Gojjam after the Zemetcha campaign and the relative cessation of armed conflict in the region. The accuracy of the figures in terms of the number of peasant associations which exist in form, is less important than the apparent local structures which these associations represent. Conversations with a number of administrators and government officials working with associations made it clear that associations were essentially grafted onto the existing leadership structures in local areas. As one senior official candidly put it, the level of political consciousness in the region is very low.

The problems encountered in forming peasant associations which represent some break from the previous structure of authority and leadership are understandable. The government has not attempted to implement land reform in the area. The reforms which the 1975 Proclamation did make are significant but largely unpopular--and probably still unenforceable. The main points of these reforms were to grant possessory rights to land tilled by tenants, to abolish all dues and obligations of peasants to "any organization, chicka shum, gultegna, feressegna, and the like", and to put an end to all land claims.

These reforms would primarily benefit the landless and, implicitly, the low-status artisan groups comprising an estimated 5 percent of the highland population in Gojjam. There are no accurate figures on the number of landless tenants, but earlier surveys indicated a figure of about 13 percent for the entire region. Even some of these tenants may have been able to activate claims to land under the rist system, an action which the land reform proclamation made impossible. Given these estimates of those who have the most to gain from the reforms, and the creation of strong peasant associations, the amount of support for a change of local leadership is questionable.

The agents attempting to establish associations apparently formed associations out of what leadership was at hand and called them peasant associations. Attempts to consolidate and reform these associations in line with the broad based participatory organizations intended have been underway since about September, 1976 by Politburo cadres. In April of this year, however, there were reported to be only 40 cadres in the entire region, far too few to have much impact on the almost 2,500 peasant associations said to exist.

In the face of the resistance already encountered and the unenthusiastic response to the reforms proposed, the government and the cadres are apparently proceeding cautiously in their motivational efforts. The main thrust of the government's efforts appears to be directed at the consolidation of the urban dwellers associations in the towns of the region. It is likely that most of the cadres in the region are operating in these towns. This is a traditional venue for changes in Gojjam, beginning in the central government created towns, but is quite the reverse of the progress of the revolution in the south of Ethiopia. In most of the areas where the revolutionary reforms were well received, the revolution spread from the rural countryside to the towns. Towns in much of southern Ethiopia were the refuge of landlords abandoning their holdings and were the last centers of opposition to the reforms in general and the formation of peasant associations.

The success of the government's approach in Gojjam is not a matter for concern here. What is of concern is the apparent existence of peasant association structures controlled by traditional local leaders. Land reform agents in several areas indicated with some reluctance that tenure arrangements and traditional land allocation systems were still in operation and that they had little hope in affecting these in the near future.

The traditional authority structure in Gojjam was relatively broad based and respresentative of local concerns, but it was not participatory in any formal sense. It functioned well because it involved strong inter-personal ties between leaders and commoners and was based on relationships in a number of overlapping spheres--political, religious, economic and social. The dynamics of the traditional system lay in large part in the land tenure system described earlier. This system allocated use-rights at any point in time while allowing individuals considerable scope for the exercise of personal ambitions and allowing hamlets with a system for significant reallocations of use-right to land.

One area of activity which local EPID agents claim that Peasant Associations have pursued is the formation of cooperatives. The formation of cooperatives has been given high priority by the government in Gojjam presumably because it is an area of collective activity which will not immediately threaten local institutions and practices. EPID claims that there are a total of 159 cooperatives of various forms in Gojjam ranging from 4 in Metekel to 43 in Bahar Dar Awraja. These include Service Cooperatives of Farmers, Weavers, Women and Proletariates.

Many of these cooperatives were probably formed before the revolution, and without specific guidelines on their formation, they have taken a variety of forms. Generally they act as buying cooperatives for inputs and raw materials and marketing cooperatives for finished products or produce. Almost all of them suffer from undercapitalization, since the amounts paid in by members are usually nominal. Few of them appear to build their capital by reinvesting a percentage of the transactions they conduct. Many of the farmers service cooperatives appear to act as buying groups, collecting money and orders for specific purchases on a one-time basis.

Officials working with cooperatives in Gojjam said that transportation is a major problem for the service cooperatives which have been established. Even if roads are available, vehicular transport is limited and expensive. These officials indicated that transporters are not following government regulations on transport costs. The undercapitalization of cooperatives is even more of a problem because of generally rising prices and a scarcity of goods which the cooperatives need to buy for their members. The State Distribution Agency, with outlets located in Bahar Dar and Debre Markos, is not able to supply goods regularly to cooperatives. The Agency experiences both shortages and delays in delivery, frequently being able to supply only salt and sugar.

One Producers Cooperative has been formed in the region in T'is Abaya near Bahar Dar. The cooperative is currently collectively farming only the former communal pasture in the peasant associations. Cooperative members still individually farm their own plots but jointly work the collective plot. Labor put into the collective plot is accounted for by person hours regardless of whether the members is using his oxen or simply contributing hand labor. 80 of the 380 families in the cooperative do not have oxen. EPID is presently helping the cooperative apply for a loan of 160,000 Birr from the Agriculture and Industrial Development Bank. The loan is to be used to set up a dairy herd, a poultry farm, and irrigation system and to purchase a small truck for transporting inputs and produce. The cooperative members have agreed to collectivize all of their holdings if the loan is obtained. The

peasant associations on which this cooperative is based is at the end of the all weather road from Bahar Dar to the T'is Abaya Generating Plant and enjoys unusually good access to markets for its produce. It is also not clear if the area of the peasant association is under rist tenure or some other system.

In at least one part of the region, EPID is attempting to use its tractor rental program as an incentive to peasant associations to establish collective plots. The tractors are now being rented only to associations with collective plots which permits them considerable more efficiency in cultivating larger collective plots.

d. Motivation

The direction in which production arrangements under peasant associations are expected to evolve is clearly toward collective production, consumption and response to collective reward structures. At the present time, however, most rural peasants can be expected to operate according to more traditional motivation structures. With the exception of some of the southern groups, the predominant orientation of traditional systems is toward individual rewards for individual accomplishments. Moderating systems and beliefs, as well as various redistribution mechanisms, co-existed with this predominant motivation structure, but these traditional systems have been some of the first to be opposed by those guiding the consolidation of peasant associations.

It is expected that peasants will adjust in time to the new structures and reward systems with which they are being presented. For the short range, however, agricultural production is likely to be strongly linked with materialistic benefits and rewards which can be obtained by increased production and marketing profits. For a variety of reasons, the marketing and distribution system for both non-essential and essential consumer goods is severely disrupted. The causes of this appear to vary with the biases of observers. Merchants blame government intervention in production, distribution and price system. The government blames the merchants and the fact that the increased incomes of peasants have greatly increased demand for all kinds of goods, resulting in shortages. Peasants variously blame both the government and the private sectors being primarily concerned with the fact that the goods they wish and need to purchase are often not available through government or private channels.

These widespread shortages and rationing of certain categories of commodities have occurred at the time when the income of many peasants has, or could have, risen dramatically. The effects of land reform

and the severely reduced demands made on peasants for taxes and tribute on peasant production have been somewhat inconclusively debated over the past two years. Of more immediate concern here is the effect of a shortage of consumer goods and familiar investment possibilities for peasants occurring at the same time. If the former situation continues, it could seriously reduce the motivation of peasants to increase or alter production in order to benefit from new roads.

e. Participation

The communal land tenure system and relatively equitable distribution of holdings in Gojjam have been widely cited as basic reasons for opposition to some of the new changes and for the passive reaction to peasant associations. Peasant associations are based on a concept of broad-based participation and shared perception of mutual interests which is historically alien to traditional Amharic culture. This has been put in strong terms by Hoben:

> ". . . The basic Amhara pattern of group formation which constrains potential conflicts involves two types of relationship: those between patron and client, and those between clients by virtue of their common allegiance to the same patron. Patron-client ties are voluntary and personal in nature and diffuse in scope.
>
> The relationship between the clients of a patron is characterized by mistrust, suspicion and malicious rivalry. Their ability to cooperate, to the extent that they do, rests on quarreling rather than from a sense of purposical solidarity on his behalf." 1/

Although applied to traditional Amharic society, most of this analysis appears to hold true today. The concensus expressed by administrators, the problems encountered with peasant associations and cooperatives, and limited observation of rural leadership being exercised support the conclusion that this pattern, and local perception of proper group structure, still exists. From this perspective there is little tradition of participation in the sense of consensual decision making or voluntary collective action. This traditional system and individual set of beliefs presents significant problems for those who seek to change them.

Leaders in the traditional sense in Gojjam do not have their power and authority from the ownership of land but, more often than not, have gained rights to a relatively large grant of land because they are leaders.

1/ Allan Hoben: "Social Stratification in Traditional Amhara Society", pp. 195-196 in Social Stratification in Africa, ed. by Arthur Tuden and Leonard Plotnicoy.

Removing local leaders from office because they have more land than other peasants only creates the need to have a new leader chosen who, if the traditional system were operative, could proceed to validate claims to more land.

Applied to the present situation of peasant associations this is likely to mean that if traditional leaders are excluded from office, associations will choose new leaders to perform the same roles rather than making decisions in unfamiliar ways.

The lack of participation in systems of decision making at resource allocation by women and low-status artisan groups is not surprising in this context. There is, in a real sense, a lack of participation in the same processes by those who are included in the system.

In relation to the construction and local development of benefits from rural roads, this situation implies that it is likely that leaders, not groups, will make decisions. These decisions need not be inequitable in their effect, though there is little internal impetus for the equitable distribution of benefits from the projects.

The distribution of land holdings, however, is relatively equitable and it has been created and sustained by the same type of system. This provides strong evidence that the local hierarchical pattern of authority may end up producing reasonably equitable benefits within rubric of peasant associations. This will not, however, be accomplished in the manner in which associations are intended to operate, at least not in the foreseeable future.

f. Administrative Reform

Attempts to modernize and centralize the national administrative bureaucracy over the last three decades had effects beyond the administrative sphere in regions such as Gojjam. As described earlier, the traditional political-military-bureaucratic structure represented a merging of authority based on national and local powers with the dividing line, in terms of loyalities, depending on the momentary balance of power between these poles. The institutionalizing of administrative units and, more directly, the substitution of salaries for tribute collection rights to administrators introduced a rigidity and system of rewards alien to the traditional hierarchy. Although efforts to change the system outpaced the actual effected changes, the increasing specialization and modern qualifications required for at least regional and awraja administrative positions made these higher levels of the structure an intrusion of, rather than a link with, the central government.

After the revolution and the resistance to the land reform, the new government has even further upgraded the qualifications of the administrators appointed to the woreda level. In addition to their education and experience, administrators posted to Gojjam are expected to have an understanding of the goals of the revolution combined with enough patience to deal with its slow progress in Gojjam.

Conversations with regional and awraja administrators and ministry officials at these levels uniformly portrayed a situation in which administrators below the woreda level (which still exist in Gojjam), were traditional leaders who perceived the administrative ranks above them in traditional terms. Both administrators and other officials expressed the view that little was likely to happen in rural areas, peasant associations notwithstanding, unless local leaders were told to do things.

This situation was demonstrated by visiting a "self-help" road project which was described by an administrator as being undertaken because of the desire of the local peasant associations for the road. The head of the project, when visited, turned out to be the sub-woreda chief of the area who appeared and acted as a traditional leader, governing from a combination of power, respect and personal accomplishments. When asked why the project was being done, the sub-woreda chief said that it was because he had been told to do it by the administrator above him.

The partial reform of the administrative structure described here may not accurately portray the situation throughout Gojjam. It would appear to apply to most of the region. The current situation in Gojjam, involving considerably entrenched resistance to almost any changes in existing rural patterns, in one sense justifies this partially revolutionized administrative system as a temporarily acceptable compromise on the government's part. It ensures that opposition to the goals of the revolution will not be encouraged by sympathetic administrators, while allowing Politburo cadres and other motivating forces to work slowly with rural peasants.

As exemplified in the road project described above, this situation does present problems for a development project which requires the active participation of the rural peasants. Thus gaining the participation of the rural peasants in the construction of roads must be approached through the higher levels of the administration in the idiom of post-revolutionary participatory structures. Once at the local level, however, participation will be mobilized according to traditional patterns and utilizing traditional motivations. The quality of this participation cannot be judged prima facie, but it is not likely to represent the consensually determined, voluntary participation hoped for. The situation is likely to present even more problems with regard to the distribution of the potential benefits of road access. It seems apparent that these will be distributed according to traditional networks and priorities, which may or may not be reasonably equitable.

6. Social Services

1) Education

Education in government schools in Gojjam does not present the same cultural dilemma faced by non-Amharic groups in Gemu Gofa. Parents in Gojjam do not fear the stress on Amharic language and general values encountered in government schools, but they do continue to resist the nationalistic element in these schools as well as the removal of the child's presence from the family labor pool and the "normal context" of traditional socialization. Despite this resistance to this type of education, Ministry of Education figures indicate a doubling of enrollment in schools from the elementary to the senior secondary level in the last five years, from about 40,000 in 1972 to about 82,000 in 1977.

Within Gojjam, and Amhara areas generally, Ethiopian Christian church schools offer an educational alternative to secular schools. Government figures indicate only 14 church schools in the entire region, to which must be added the limited traditional education offered by some parish churches. Well before the revolution, however, the traditional career options to Gojjami boys to become peasant, soldier or priest were becoming obsolete. The increasing professionalization of administration and the civil service made traditional avenues to advancement less relevant and a modern secular education more important.

Schools in Gojjam Province by Level and Awraja, 1977

Awraja	Elementary	Junior Secondary School	Senior Secondary School	Church School
Agew Midir	16	3	1	1 (M)
Bahar Dar	32	5	1	1
Bichena	19	2	1	3
Debre Markos	37	3	1	3
Kola Dega Damot	29	5	1	4
Motta	17	2	1	3
Metekel	12	3	0	2 (M)
Total	162	23	6	14 Church 3 Mission

Source: Regional Education Officer, Debre Markos, April 1977.

The figures presented above reflect an increase of almost 25 percent in the total number of schools in the region in the last two years, composed of 29 elementary, 10 junior secondary and 2 senior secondary schools. The Rural Projects Administration plans to construct an additional 49 schools during the present year. It is not known what progress has been made in relation to these plans.

Indicative of the level of impact which the Zemetcha had in Gojjam, regional education officials were not aware of any schools which were built during the campaign. They admitted that it was possible but they simply did not know about them. Education officials in one awraja were not optimistic about the prospects for self-help schools being constructed by peasant associations. They claimed that since the education tax had been abolished, communities were no longer willing to work on schools in their area. At the same time they said the student enrollment in the awraja was increasing more rapidly than before. Of the total of 33 schools they reported in the awraja, only 3 of these could not be reached by vehicles at least part of the year. Roads not only made their support and supervision of the schools easier, but generally made it easier to keep good teachers in the schools. The new schools to be built in the area by the Rural Projects Agency (RPA) were likely to be all in the areas which were at least seasonally accessible by roads.

Urban areas in Gojjam do not present the cultural distinctions from surrounding rural populations found in Gemu Gofa. They still represent concentrations of social services and amenities, supported by the officials and civil servants in the towns and by the ties which rural elites maintain with the sources of power and commercial activity found in towns. Rural roads aim not immediately to disperse this concentration of schools in an area such as Gojjam. Since towns are not fundamentally alien in cultural terms to rural dwellers, they have less reluctance and in fact some preference to send their children whom they wish to go to schools to urban areas. Thus many civil servants posted in Gojjam appeared to prefer to leave their children in school in Addis Ababa rather than move them to schools in Gojjam, which they viewed as relatively less advantageous institutions. The same pattern is repeated within the region.

Thus despite the stress on the importance of roads for the provision of adequate educational facilities by officials, their own complaints about the willingness of local people to contribute to support schools raises doubts as to the local support for official views on demands for more rural schools.

2. Public Health

Somewhat in contrast with government educational facilities, the rural population of Gojjam appears willing and ready to assist in the provision of health care facilities. During the Zemetcha in Gojjam, eight

clinics were built by students with the assistance of some local peasants. Since then an additional two clinics have been built by peasant associations in Metekel awraja and subsequently staffed by the Ministry. Nine new clinics are to be built this year by the RPA, primarily in rural areas. At the present time the Ministry is attempting to stress that clinics be built in less accessible areas and maintain a minimum distance between clinics of 25 kilometers. One of the problems with the Zemetcha-built clinics is that they were concentrated in areas along roads, in some cases too close together for the resources available to the Ministry.

The current health facilities in the region are listed below.

Health Facilities in Gojjam Administered
by the Ministry of Health by Awrajas, 1977

Awrajas	Hospitals	Health Centers	Clinics	Pharmacies
Agew Midir	0	1	5	-
Bahar Dar	1	1	7	-
Bichena	0	1	5	-
Debre Markos	1	1	9	-
Kola Dega Damot	1	1	10	3
Metekel	0	1	9	-
Motta	0	1	7	-
Total	3	7	52	3

Source: Regional Public Health Administrator, Debre Markos, April 1977.

Although the Ministry officials in the region acknowledged that too many of their facilities were concentrated along roads, they also claimed that almost fifty percent of their clinics could only be reached by walking and had to be supplied by mules. Since each facilitity was allowed a fixed budget, regardless of its patient load or service area, the added cost of transporting supplies by pack animal and providing administration to remote clinics reduced their capabilities to provide service. Health officials also indicated that it was more difficult to sustain qualified staff in remote locations and much more difficult to provide them with support and supervision. Staffing problems in the region and the nation generally, had been eased by the requirement last year that all health workers trained in government institutions had to work for the government.

The basic lack of facilities adequate to the needs of the rural population were compounded by the minimal budget provided to the region and the responsibilities which staff had to carry out. The workload made it particularly difficult to undertake the type of public sanitation work which was required in rural areas. Sanitary workers posted in Health Centers were now responsible for raising the political consciousness of Health Workers, so that they in turn would be motivated to agitate the masses to undertake effective local campaigns in village health and sanitation and revolutionary doctrine. The regional office was now receiving materials from Chinese and Vietnamese sources which presented models and practical knowledge required for carrying out a consciousness-raising campaign on health and sanitation and related subjects.

h. Summary - Gojjam

The social and cultural system in which the rural roads program will operate in Gojjam is considerably different from Gemu Gofa. Here the traditions are more homogeneous and more firmly entrenched. Resistance to some of the central precepts of the Ethiopian Revolution is greater. The arguments in favor of the rural roads program are largely in terms of increased agriculture production and marketing. Gojjam is an important part of the Ethiopian "breadbasket" and eventually must produce more for export to the perennial food-deficit parts of the country. Roads will assist in increased production and marketing. There are, however, problems which the Government will have to be aware of. The motivation for increasing production will not be great if increased family income has no outlet through a more diversified consumer product market than now exists. The self-help road component of the project may be more difficult to implement in the context of retained traditional hierarchical decision-making, no matter how this latter process is disguised with the trappings of revolutionary change.

ANNEX F

BACKUP FINANCIAL AND BUDGETARY TABLES

AND RELATED COST CALCULATIONS

TABLE 5

3-YEAR PROJECT COSTS
(US$000)

Description of Input	Gemu Gofa	Gojjam	Central Office*	Total Project	AID FX	AID LC	EPMG FX	EPMG LC
1. Facilities								
a. Offices	167,857	167,857	71,428	407,142		224,925		182,217
b. Construction Camps	237,900	219,600		457,500		457,500		
2. Personnel								
a. Salary	2,274,142	2,179,762	275,005	4,728,909				4,728,909
b. Per Diem	424,285	424,285	22,680	871,250				871,250
c. Food	62,301	52,254		114,555				114,555
3. Non-Personnel	341,122	326,965	41,250	709,337				709,337
4. Equipment	2,225,354	2,225,354		4,450,708	4,450,708			
5. P.O.L.	673,907	602,740		1,276,647			1,276,647	
6. Tires	365,378	325,536		690,914	690,914			
7. Repair Parts	383,506	330,291		713,797	713,797			
8. Hand Tools	106,352	106,352		212,704		212,704		
9. Materials & Supplies	130,062	116,449		246,511				246,511
Sub-Total	7,392,166	7,077,445	410,363	14,879,974				
Technical Assistance				952,706	952,706			
Training				287,500	287,500			
Total				16,120,180	7,096,625	895,129	1,276,647	6,852,779

AID Total = 7,991,754 (49%)
EPMG Total = 8,129,426 (51%)

* Central Office Costs pro rated at 14 percent of total Central Office costs.

Ethiopian Road Authority Expenditures as Proportion of Central Government Expenditures, 1970-82

(Birr million, 1976 prices)

	ACTUAL							PROJECTED					
Fiscal Year:	1970	1971	1972	1973	1974	1975 1/	1976 1/	1977	1978	1979	1980	1981	1982
Constant GDP at factor cost 2/	4660	4860	5100	5240	5310	5330	5490	5600	5710	5880	6060	6300	6550
(% change over previous year)	-	(4.5)	(4.8)	(2.7)	(1.5)	(0.3)	(3.0)	(2)*	(2)*	(3)*	(3)*	(4)*	(4)*
Government Expenditures 3/	510	580	660	680	690	1010	1100	1120	1140	1180	1210	1260	1310
(% Share of GDP)	(11)	(12)	(13)	(13)	(13)	(19)	(20)	(20)*	(20)*	(20)*	(20)*	(20)*	(20)*
Ethiopian Road Authority Expenditures 4/	75	87	87	97	86	104	140	153	172	190	194	211	192
(% Share of total Government Expenditures)	(15)	(15)	(13)	(14)	(12)	(10)	(13)	(14)	(15)	(16)	(16)	(17)	(15)

* Indicates an assumption used for the projections.
1/ Data for 1975 and 1976 is provisional.
2/ Based on series at 1960/61 prices. Data for 1977 onwards based on growth rate assumptions.
3/ Converted to c nstant prices using GDP deflator. Projections based on 20% GDP share.
4/ Converted to constant prices using GDP deflator. Projections based on mission estimates.

Source: IDA Report No. 14166-Et. GDP data from Central Statistical Office and mission estimates. Expenditure data from Ministry of Finance, ERA; projections based on mission estimates.

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Ethiopian Road Authority Expenditures, 1971-76

Fiscal Year:	1971 Budget	1971 Actual	1972 Budget	1972 Actual	1973 Budget	1973 Actual	1974 Budget	1974 Actual	1975 Budget	1975 Actual	1976 Budget	1976 Actual
	(Birr Million)											
Capital Expenditure												
Road Construction												
- direct labor	2.7	2.5	17.8	6.9	10.3	10.5	9.7	8.3	6.6	9.7	47.5	27.1
- Contract	33.0	34.4	52.1	25.8	40.2	30.2	57.1	30.2	60.6	37.7	63.8	41.2
Equipment and buildings	0	0	1.9	7.6	4.9	2.5	9.4	0.6	13.0	5.9	45.8	38.1
Other (studies, training)	1.2	2.0	0	0.6	0.8	0.6	1.0	0.5	1.6	0.4	0.7	0.5
Total capital expenditures	36.9	38.9	71.8	40.9	56.2	43.8	77.2	39.6	81.8	53.7	157.8	106.9
Current Expenditure												
Administration	2.5	2.3	2.3	2.6	2.5	2.5	3.1	3.0	2.5.	2.5	2.6	2.5
Engineering and technical services	5.1	4.9	5.4	4.8	5.5	5.5	6.7	6.5	6.2	5.2.	5.6	5.5
Road Maintenance	14.6	14.8	14.6	13.4	17.9	17.8	20.2	18.8	26.3	24.7	27.3	26.0
Total Current Expenditure	22.2	22.0	22.3	20.8	25.9	25.8	30.0	28.3	35.0	32.4	35.5	34.0
Total Captial and Current Expenditure	59.1	60.9	94.1	61.7	82.1	69.6	107.2	67.9	116.8	86.1	193.3	140.9

Sources: IDA Report No. 19166-Et. Budgetary Revenue and Expenditure, 1971 to 1974, Budget Proclamations 1975 and 1976, Ethiopian Road Authority Annual Report 1975 and 1976.

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COST

SUMMARY

GEMU GOFA PROVINCE

Description	Year One	Year Two	Year Three	Total
1. Facilities				
a. Offices	167,857	-	-	167,857
b. Construction Camp	109,800	54,900	73,200	237,900
2. Personnel				
a. Salary	675,838	760,638	837,666	2,274,142
b. Per Diem	127,957	141,390	154,938	424,285
c. Food	19,957	20,442	21,902	62,301
3. Non-Personnel	101,376	114,096	125,650	341,122
4. Equipment	2,225,354	-	-	2,225,354
5. P.O.L.	204,214	224,635	245,058	673,907
6. Tires	110,718	121,799	132,861	365,378
7. Repair Parts	116,214	127,835	139,457	383,506
8. Hand Tools	70,900	17,726	17,726	106,352
9. Materials & Supplies	39,434	43,354	47,274	130,062
Total	3,969,619	1,626,815	1,795,732	7,392,166

YEAR ONE

GEMU GOFA PROVINCE

Description	Central H.Q.	Province H.Q.	Equipment Augmentation Unit	Construction Unit	Maintenance Unit	Total
1. Facilities						
a. Offices	17,857	50,000	100,000	-	-	167,857
b. Construction Camps	-	-	-	109,800	-	109,800
2. Personnel						
a. Salary	29,222	149,100	63,948	344,600	88,968	675,838
b. Per Diem	2,893	12,636	11,340	87,480	13,608	127,957
c. Food	-	-	-	15,015	4,942	19,957
3. Non-Personnel	4,383	22,366	9,592	51,690	13,345	101,376
4. Equipment	-	207,152	1,027,050	697,490	293,662	2,225,354
5. P.O.L.	-	28,488	84,354	61,048	30,324	204,214
6. Tires	-	5,136	54,446	28,472	22,664	110,718
7. Repair Parts	-	10,104	58,163	36,380	11,568	116,214
8. Hand Tools	-	-	-	70,900	-	70,900
9. Materials & Supplies	-	-	-	37,434	2,000	39,434
Year One	54,355	484,982	1,408,892	1,540,309	481,081	3,969,619

YEAR TWO

GEMU GOFA PROVINCE

Description	Central H.Q.	Province H.Q.	Equipment Augmentation Unit	Construction Unit	Maintenance Unit	Total
1. Facilities						
a. Offices	-	-	-	-	-	-
b. Construction Camps	-	-	-	54,900	-	5[illegible]90
2. Personnel						
a. Salary	49,330	164,010	70,343	379,060	97,865	760,63
b. Per Diem	3,819	13,900	12,474	96,228	14,969	141,39
c. Food	-	-	-	15,120	5,322	20,44
3. Non-Personnel	7,404	24,602	10,551	56,859	14,680	114,09
4. Equipment	-	-	-	-	-	-
5. P.O.L.	-	31,337	92,789	67,153	33,356	224,63
6. Tires	-	5,650	59,891	31,319	24,939	121,79
7. Repair Parts	-	11,115	63,973	40,018	12,724	1[illegible]83
8. Hand Tools	-	-	-	17,726	-	17,72
9. Material & Supplies	-	-	-	41,154	2,200	43,354
Year Two	60,583	250,614	310,026	799,537	206,055	1,626,81

YEAR THREE

GEMU GOFA PROVINCE

Description	Central H.Q.	Province H.Q.	Equipment Augmentation Unit	Construction Unit	Maintenance Unit	Total
1. Facilities						
a. Offices	-	-	-	-	-	-
b. Construction Camps	-	-	-	73,200	-	73,200
2. Personnel						
a. Salary	61,726	178,920	76,738	413,520	106,762	837,666
b. Per Diem	4,860	15,164	13,608	104,976	16,330	154,933
c. Food	-	-	-	16,200	5,702	21,902
3. Non-Personnel	9,259	26,838	11,511	62,028	16,014	125,650
4. Equipment	-	-	-	-	-	-
5. P.O.L.	-	34,186	101,225	73,258	36,389	245,058
6. Tires	-	6,164	65,335	34,165	27,197	132,861
7. Repair Parts	-	12,125	69,794	43,656	13,882	139,457
8. Hand Tools	-	-	-	17,726	-	17,726
9. Materials and Supplies	-	-	-	44,874	2,400	47,274
Year Three	75,845	273,397	338,211	883,603	224,676	1,795,732

C O S T

S U M M A R Y

GOJJAM PROVINCE

Description	Year One	Year Two	Year Three	Total
1. Facilities				
a. Office	167,857	-	-	167,857
b. Construction Camps	109,800	54,900	54,900	219,600
2. Personnel				
a. Salary	647,238	729,178	803,346	2,179,762
b. Per Diem	127,957	141,390	154,938	924,285
c. Food	16,174	17,418	18,662	52,254
3. Non-Personnel	97,086	109,377	120,502	326,965
4. Equipment	2,225,354	-	-	2,225,354
5. P.O.L.	182,648	200,913	219,179	602,740
6. Tires	98,644	108,518	118,374	325,53[illegible]
7. Repair Parts	100,088	110,097	120,106	330,291
8. Hand Tools	70,900	17,726	17,726	106,352
9. Materials & Supplies	35,301	38,817	42,331	116,449
Totals	3,879,047	1,528,334	1,670,064	7,077,445

YEAR ONE

GOJJAM PROVINCE

Description	Central H.Q.	Province H.Q.	Equipment Augmentation Unit	Construction Unit	Maintenance Unit	Total
1. Facilities						
a. Offices	17,857	50,000	100,000	-	-	167,857
b. Construction Camps	-	-	-	109,800	-	109,800
2. Personnel						
a. Salary	29,222	149,100	63,948	316,000	88,968	647,238
b. Per Diem	2,893	12,636	11,340	87,480	13,608	127,957
c. Food	-	-	-	11,232	4,942	16,174
3. Non-Personnel	4,383	22,366	9,592	47,400	13,345	97,086
4. Equipment	-	207,152	1,027,050	697,490	293,662	2,225,354
5. P.O.L.	-	28,488	71,052	52,784	30,324	182,648
6. Tires	-	5,136	46,828	24,016	22,664	98,644
7. Repair Parts	-	10,104	48,224	30,192	11,568	100,088
8. Hand Tools	-	-	-	70,900	-	70,900
9. Materials and Supplies	-	-	-	33,301	2,000	35,301
Year One	54,355	484,982	1,378,034	1,480,595	481,081	3,879,047

YEAR TWO

GOJJAM PROVINCE

	Description	Central H.Q.	Province H.Q.	Equipment Augmentation Unit	Construction Unit	Maintenance Unit	Total
1.	Facilities						
	a. Offices	-	-	-	-	-	-
	b. Construction Camps	-	-	-	54,900	-	54,90
2.	Personnel						
	a. Salary	49,360	164,010	70,343	347,600	97,865	729,17
	b. Per Diem	3,819	13,900	12,474	96,228	14,969	141,39
	c. Food	-	-	-	12,096	5,322	17,41
3.	Non-Personnel	7,404	24,602	10,551	52,140	14,680	109,37
4.	Equipment	-	-	-	-	-	-
5.	P. O. L.	-	31,337	78,158	58,062	33,356	200,91
6.	Tires	-	5,650	51,511	26,418	24,939	108,51
7.	Repair Parts	-	11,115	53,047	33,211	12,724	11[illegible]9
8.	Hand Tools	-	-	-	17,726	-	17,72
9.	Materials and Supplies	-	-	-	36,617	2,200	38,81
	Year Two	60,583	250,614	276,084	734,998	206,055	1,528,33

YEAR THREE

GOJJAM PROVINCE

Description	Central H.Q.	Province H.Q.	Equipment Augmentation Unit	Construction Unit	Maintenance Unit	Total
1. Facilities						
a. Offices	-	-	-	-	-	-
b. Construction Camps	-	-	-	-	-	-
Personnel						
a. Salary	61,726	178,920	76,738	379,200	106,762	803,346
b. Per Diem	4,860	15,164	13,608	104,976	16,330	154,938
c. Food	-	-	-	12,960	5,702	18,662
3. Non-Personnel	9,259	268,838	11,511	56,880	16,014	120,502
4. Equipment	-	-	-	-	-	-
5. P.O.L.	-	34,186	85,263	63,341	36,389	219,179
6. Tires	-	6,164	56,194	28,819	27,197	118,374
Repair Parts	-	12,125	57,869	36,230	13,882	120,106
8. Hand Tools	-	-	-	17,726	-	17,726
9. Materials and Supplies	-	-	-	39,931	2,400	42,331
Year Three	15,845	273,397	301,183	794,963	224,676	1,670,064

YEAR ONE

COST SUMMARY

CENTRAL HEADQUARTERS

I. Office:

Cost of New Headquarters Building	$250,000
15 year amortization	16,667 per year

II. Personnel:

A. Salary

$34,093 per month x 12 months = $409,116

B. Per Diem

125 personnel x 0.50 x $2.25 per day x 288 days = $40,500

III. Non-Personnel

$409,116 x 0.15 = $61,367

IV. Summary

A.	Office	$ 16,667
B.	Personnel	449,616
C.	Non-Personnel	61,367
	Total	$527,650

V. Project Cost

$$\frac{\$527,650 \times 2 \text{ provinces}}{14 \text{ provinces}} = \$75,378$$

Gojjam Province = $37,689

Gemu Gofa Province = $37,689

YEAR TWO

COST SUMMARY

CENTRAL HEADQUARTERS

I. Office:

Annual Cost of Headquarters Building $16,667

II. Personnel

A. Salary

$52,352 per month x 12 months x 1.10 = $691,047

B. Per Diem

150 personnel x 0.50 x $2.25/day x 288 days x 1.10 = $53,460

III. Non-Personnel

$691,047 x 0.15 = $103,658

IV. Summary

A.	Office	$16,667
B.	Personnel	744,507
C.	Non-Personnel	103,658
		$ 864,832

V. Project Cost

$$\frac{\$864,832 \times 2 \text{ provinces}}{14 \text{ provinces}} = \$123,548$$

Gojjam Province	$ 61,773
Gemu Goffa Province	$ 61,773

YEAR THREE

COST SUMMARY

CENTRAL HEADQUARTERS

I. Office

Annual Cost of Headquarters Building $16,667

II. Personnel

A. Salary

$60,011 per month x 12 months x 1.20 = $864,159

B. Per Diem

175 personnel x 0.50 x $2.25/day x 288 days x 120 = $68,040

III. Non-Personnel

$864,159 x 0.15 = $129,624

IV. Summary

A.	Office	$ 16,667
B.	Personnel	932,199
C.	Non-Personnel	129,624
		$1,078,490

V. Project Cost

$$\frac{\$1,078,490 \times 2 \text{ provinces}}{14 \text{ provinces}} = \$154,070$$

Gojjam Province	$77,035
Gemu Gofa Province	$77,035

YEAR ONE

COST SUMMARY

GEMU GOFA PROVINCIAL HEADQUARTERS

I.	**Office:**	
	Cost of Provincial Headquarters Building and Workshop	= $ 150,000
	15 year amortization of $150,000	= 10,000
II.	**Personnel:**	
	A. Salary	
	$17,754 per month x 12 months	= $ 213.048
	B. Per Diem	
	74 personnel x 0.5 x $2.25/Day x 288 days	= 23,976
	C. Total Personnel Cost	= $ 237,024
III.	**Non-Personnel**	
	$ 213,048 salary x 0.15 of salary	= $ 31,958
IV.	**Equipment:**	
	A. Equipment	
	1. Headquarters and Workshop	
	$176,000 amortization over 10 years	= $ 17,600
	2. Augmentation Unit Equipment	
	$872,600 amortization over 10 years	= 87,260
	3. Total Equipment Cost	= $ 104,860
	B. P.C.L. Cost	
	1. Headquarters and Workshop	= $ 28,488
	2. Augmentation Unit Equipment	= 84,354
	3. Total P.O.L. Cost	= $ 112,842
	C. Tire Cost:	
	1. Headquarters and Workshop	= $ 5,136
	2. Augmentation Unit Equipment	= 54,446
	3. Total Tire Cost	= $ 59,582
	D. Repair Parts Cost	
	1. Headquarters and Workshop	= $ 10,104
	2. Augmentation Unit Equipment	= 58,162
	3. Total Repair Parts Cost	= $ 68,266
	E. Total Equipment Cost	= $ 345,550
V.	**Summary of Cost**	
	A. Office	= $ 10,000
	B. Personnel	= 237,024
	C. Non-Personnel	= 31,958
	D. Equipment	= 345,550
	E. Total Province Cost	= $ 624,532
VI.	**Distribution of Cost**	
	A. Construction is 85% of Headquarters Cost	= $ 530,852
	B. Maintenance is 15% of Headquarters Cost	= $ 93,680

YEAR TWO

COST SUMMARY

GEMU GOFA PROVINCIAL HEADQUARTERS

I.	**Office:**	
	15 year amortization of $150,000	= $ 10,000
II.	**Personnel**	
	A. Salary	
	$17,754 per month x 12 months x 1.10	= $ 234,353
	B. Per Diem	
	74 personnel x 0.5 x $2.25/day x 288 days x 1.10	= 26,374
	C. Total Personnel Cost	= $ 260,727
III.	**Non-Personnel**	
	$234,353 salary x 0.15 of salary	= $ 35,153
IV.	**Equipment:**	
	A. Equipment	
	1. Headquarters and Workshop	
	$176,000 amortization over 10 years	= $ 17,600
	2. Augmentation Unit Equipment	
	$872,600 amortization over 10 years	= 87,260
	3. Total Equipment Cost	= $ 104,860
	B. P.O.L. Cost	
	1. Headquarters and Workshop = $28,488 x 1.10	= $ 31,337
	2. Augmentation Unit Equipment = $84,354 x 1.10	= 92,789
	3. Total P.O.L. Cost	= $ 124,126
	C. Tire Cost:	
	1. Headquarters and Workshop = $5,136 x 1.10	= $ 5,650
	2. Augmentation Unit Equipment = $54,446 x 1.10	= 59,891
	3. Total Tire Cost	= $ 65,541
	D. Repair Parts Cost	
	1. Headquarters and Workshop = $10,104 x 1.10	= $ 11,115
	2. Augmentation Unit Equipment = $58,162 x 1.10	= 63,978
	3. Total Repair Parts Cost	= $ 75,093
	E. Total Equipment Cost	= $ 369,620
V.	**Summary of Cost**	
	A. Office	= $ 10,000
	B. Personnel	= 260,727
	C. Non-Personnel	= 35,153
	D. Equipment	= 369,620
	E. Total Province Cost	= $ 675,500
V.	**Distribution of Cost**	
	A. Construction is 85% of Headquarters Cost	= $ 574,175
	B. Maintenance is 15% of Headquarters Cost	= $ 101,325

YEAR THREE

COST SUMMARY

GEMU GOFA PROVINCIAL HEADQUARTERS

I.	**Office:**	
	15 year amortization of $150,000	= $ 10,000
II.	**Personnel:**	
	A. Salary	
	$17,754 per month x 12 months x 1.20	= $ 255,658
	B. Per Diem	
	74 personnel x 0.5 x $2.25/day x 288 days x 1.20	= 28,772
	C. Total Personnel Cost	= $ 284,430
III.	**Non-Personnel:**	
	$255,658 salary x 0115 of salary	= $ 38,349
IV.	**Equipment:**	
	A. Equipment	
	1. Headquarters and Workshop	
	$176,000 amortization over 10 years	= $ 17,600
	2. Augmentation Unit Equipment	
	$872,600 amortization over 10 years	= 87,260
	3. Total Equipment Cost	= $ 104,860
	B. P.O.L. Cost	
	1. Headquarters and Workshop = $28,488 x 1.20	= $ 34,186
	2. Augmentation Unit Equipment = $84,354 x 1.20	= 101,225
	3. Total P.O.L. Cost	= $ 135,411
	C. Tire Cost	
	1. Headquarters and Workshop = $5,136 x 1.20	= $ 6,164
	2. Augmentation Unit Equipment = $54,446 x 1.20	= 65,335
	3. Total Tire Cost	= 71,499
	D. Repair Parts Cost	
	1. Headquarters and Workshop = $10,104 x 1.20	= $ 12,125
	2. Augmentation Unit Equipment = $58,162 x 1.20	= 69,794
	3. Total Repair Parts Cost	= $ 81,919
	E. Total Equipment Cost	= $ 393,689
V.	**Summary of Cost**	
	A. Office	= $ 10,000
	B. Personnel	= 284,430
	C. Non-Personnel	= 38,349
	D. Equipment	= 393,689
	E. Total Province Cost	= $ 726,468
VI.	**Distribution of Cost**	
	A. Construction is 85% of Headquarter Cost	= $ 617,498
	B. Maintenance is 15% of Headquarter Cost	= $ 108,970

YEAR ONE

COST SUMMARY

GOJAM PROVINCIAL HEADQUARTERS

I. Office:	
Cost of Provincial Headquarters Building and Workshop	= $ 150,000
15 year amortization gives annual cost of	= $ 10,000
II. Personnel:	
A. Salary	
$ 17,754 per month x 12 months	= $ 213,048
B. Per Diem	
74 personnel x 0.5 x $2.25 per day x 288 days	= $ 23,976
C. Total Personnel Cost	= $ 237,024
III. Non-Personnel:	
$213,048 salary x 0.15 of salary	= $ 31,958
IV. Equipment:	
A. Equipment	
1. Headquarters and Workshop	
$ 176,000 amortization over 10 years	= $ 17,600
2. Augmentation Unit Equipment	
$872,600 amortization over 10 years	= $ 87,260
3. Total Equipment Cost	= $ 104,860
B. P.O.L. Cost	
1. Headquarters and Workshop	= $ 28,488
2. Augmentation Unit Equipment	= $ 71,052
3. Total P.O.L. Cost	= $ 99,540
C. Tire Cost	
1. Headquarters and Workshop	= $ 5,136
2. Augmentation Unit Equipment	= $ 46,828
3. Total Tire Cost	= $ 51,964
D. Repair Parts Cost	
1. Headquarters and Workshop	= $ 10,104
2. Augmentation Unit Equipment	= $ 48,224
3. Total Repair Parts Cost	= $ 58,328
E. Total Equipment Cost	= $ 314,692
V. Summary of Cost	
A. Office	= $ 10,000
B. Personnel	= 237,024
C. Non-Personnel	= 31,958
D. Equipment	= 314,692
E. Total Province Cost	= $ 593,674
VI. Distribution of Cost	
A. Construction is 85% of Headquarters Cost	= $ 504,623
B. Maintenance is 15% of Headquarters Cost	= $ 89,051

YEAR TWO

COST SUMMARY

GOJAM PROVINCIAL HEADQUARTERS

I.	**Office:**	
	15 years amortization of $150,000	= $ 10,000
II.	**Personnel:**	
	A. Salary:	
	$ 17,754 per month x 12 months x 1.10	= $ 234,353
	B. Per Diem:	
	74 personnel x 0.5 x $2.25 per day x 288 daysx1.1	= 26,374
	C. Total Personnel Cost:	= $ 260,727
III.	**Non-Personnel:**	
	$ 234,353 salary x 0.15 of salary	= $ 35,153
IV.	**Equipment:**	
	A. Equipment:	
	1. Headquarters and Workshop	
	$176,000 amortization over 10 years	= $ 17,600
	2. Augmentation Unit Equipment	
	$872,600 amortization over 10 years	= 87,260
	3. Total Equipment Cost	= $ 104,860
	B. P.O.L. Cost	
	1. Headquarters and Workshop = $28,488 x 1.10	= $ 31,337
	2. Augmentation Unit Equipment = $71,052 x 1.10	= 78,158
	3. Total P.O.L. Cost	= $ 109,495
	C. Tire Cost	
	1. Headquarters and Workshop = $5,136 x 1.10	= $ 5,650
	2. Augmentation Unit Equipment = $46,828 x 1.10	= 51,511
	3. Total Tire Cost	= $ 57,161
	D. Repair Parts Cost	
	1. Headquarters and Workshop = $10,104 x 1.10	= $ 11,115
	2. Augmentation Unit Equipment = $48,224 x 1.10	= 53,047
	3. Total Repair Parts Cost	= $ 64,162
	E. Total Equipment Cost	= $ 335,678
V.	**Summary of Cost**	
	A. Office	= $ 10,000
	B. Personnel	= 260,727
	C. Non-Personnel	= 35,153
	D. Equipment	= 335,678
	E. Total Province Cost	= $ 641,558
VI.	**Distribution of Cost**	
	A. Construction is 85% of Headquarters Cost	= $ 545,324
	B. Maintenance is 15% of Headquarters Cost	= $ 96,234

YEAR THREE

COST SUMMARY

GOJAM PROVINCIAL HEADQUARTERS

I.	**Office:**	
	15 years amortization of $150,000	= $ 10,000
II.	**Personnel:**	
	A. Salary	
	$ 17,754 per month x 12 months x 1.20	= $ 255,658
	B. Per Diem	
	74 personnel x 0.5 x $2.25/day x 288 days x 1.20	= 28,772
	C. Total Personnel Cost	= $ 284,430
III.	**Non-Personnel:**	
	$ 255,658 salary x 0.15 of salary	= $ 38,349
IV.	**Equipment:**	
	A. Equipment	
	1. Headquarters and Workshop	
	$176,000 amortization over 10 years	= $ 17,600
	2. Augmentation Unit Equipment	
	$872,600 amortization over 10 years	= 87,260
	3. Total Equipment Cost	= $ 104,860
	B. P.O.L. Cost	
	1. Headquarters and Workshop = $28,488 x 1.20	= $ 34,186
	2. Augmentation Unit Equipment = $71,052 x 1.20	= 85,263
	3. Total P.O.L. Cost	= $ 119,449
	C. Tire Cost	
	1. Headquarters and Workshop = $ 5,136 x 1.20	= $ 6,164
	2. Augmentation Unit Equipment = $ 46,828 x 1.20	= 56,194
	3. Total Tire Cost	= $ 62,358
	D. Repair Parts Cost	
	1. Headquarters and Workshop = $10,104 x 1.20	= $ 12,125
	2. Augmentation Unit Equipment = $48,224 x 1.20	= 57,869
	3. Total Repair Parts Cost	= $ 69,994
	E. Total Equipment Cost	= $ 356,661
V.	**Summary of Cost**	
	A. Office	= $ 10,000
	B. Personnel	= 284,430
	C. Non-Personnel	= 38,349
	D. Equipment	= 356,661
	E. Total Province Cost	= $ 689,440
VI.	**Distribution of Cost**	
	A. Construction is 85% of Headquarters Cost	= $ 586,024
	B. Maintenance is 15% of Headquarters Cost	= $ 103,416

YEAR ONE

COST SUMMARY

GEMU GOFA PROVINCE LIGHT CONSTRUCTION UNIT

I. Construction Camps	
Cost of Construction Camp = $36,600 x 3 camps	$109,800
II. Personnel	
A. Salary	
$16,800 per month skilled x 12 months	$201,600
$14,300 per month unskilled x 10 months	143,000
Total Salary Cost	$344,600
B. Per Diem and Food Cost	
135 skilled x $2.25/day x 288 days	$ 87,480
462 unskilled x $0.13/day x 250 days	15,015
Total Per Diem and Food Cost	$102,495
C. Total Personnel Cost	$447,095
III. Non-Personnel Cost	
$344,600 salary x 0.15 of salary	$ 51,690
IV. Equipment	
A. Equipment	
1. Construction Equipment	
$592,600 amortization over 10 years	$ 59,260
2. Hand Tools	
$35,450 for hand tools first year	$ 35,450
3. Total Equipment	$ 94,710
B. P.O.L. Cost	$ 61,048
C. Tire Cost	$ 28,472
D. Repair Parts Cost	$ 36,380
E. Total Equipment Cost	$220,610

V. Materials and Supplies

A. Pipe Culverts

179 meters x $18.00/meter	$ 3,222

B. Rock Fords

2800 bags cement x $2.75 per bag	$ 7,700

C. Concrete Bridges

1568 bags of cement x $2.75 per bag	$ 4,312
13 ton re-steel x $500.00 per ton	$ 6,500

D. Explosives

11.200 lbs explosives x 1.00 per lb.	$ 11,200

E.	Oxygen and Acetylene	$ 4,500
F.	Total Materials and Supplies Cost	$37,434

VI. Summary

A.	Construction Camps	$108,900
B.	Personnel	447,095
C.	Non-Personnel	51,690
D.	Equipment	220,610
E.	Materials & Supplies	37,434
F.	Total	$865,729

(Note: plus $35,450 for hand tools per self-help road projects)

YEAR TWO

COST SUMMARY

GEMU GOFA PROVINCE LIGHT CONSTRUCTION UNIT

I. Construction Camp	
$36,600 x 3 camps x 0.50 re-usable	$ 54,900
II. Personnel	
A. Salary	
$16,800 per month x 12 month x 1.10 skilled	$221,760
$14,300 per month x 10 months x 1.10 unskilled	157,300
Total Salary Cost	$379,060
B. Per Diem and Food Cost	
135 skilled x $2.25/day x 288 days x 1.10	$ 96,228
432 unskilled x 0.14/day x 250 days	15,120
Total Per DIem and Food Cost	$111,348
C. Total Personnel Cost	$490,408
III. Non-Personnel Cost	
$379,060 salary x 0.15 of salary	$ 56,859
IV. Equipment	
A. Equipment	
1. Construction Equipment	
$592,600 amortization over 10 years	$ 59,260
2. Hand tools	
$35,450 x 0.25 replace second year	$ 8,863
3. Total Equipment	$ 68,123
B. P.O.L. Cost	
$61,048 x 1.11	$ 67,153
C. Tire Cost	
$28,472 x 1.10	$ 31,319

D. Repair Parts Cost

$36,380 x 1.10	$ 40,018
E. Total Equipment Cost	$206,613

V. Materials and Supplies

A. Pipe Culverts	
179 meters x $20.00 per meter	$ 3,580
B. Rock Fords	
2800 bags cement x $3.00 per bag	$ 8,400
C. Concrete Bridges	
1568 bags of cement x $3.00 per bag	$ 4,704
13 tons re-steel x 550 per ton	$ 7,150
D. Explosives	
11,200 lbs. explosives x$1.10 per lb.	$ 12,320
E. Oxygen and Acetylene	$ 5,000
F. Total Materials and Supplies	$ 41,154

VI. Summary

A. Construction Camp	$ 54,900
B. Personnel	$490,408
C. Non-Personnel	$ 56,859
D. Equipmant	$206,613
E. Materials & Supplies	$ 41,154
F. Total	$849,934

(plus $8,863 for hand tools for slef-help roads)

YEAR THREE

COST SUMMARY

GEMU GOFA PROVINCE LIGHT CONSTRUCTION UNIT

I.	Construction Camps		
	$36,600 x 4 camps x 0.50 re-usable	=	$ 73,200
II.	Personnel		
	A. Salary		
	$16,800 month x 1.20 x 12 months skilled	=	$ 241,920
	$14,300 month x 1.20 x 10 months unskilled	=	$ 171,600
	Total Salary Cost	=	$ 413,520
	B. Per Diem and Food Cost		
	135 skilled x $2.70 per day x 288 days	=	$ 104,976
	432 unskilled x $0.15 per day x 250 days	=	$ 16,200
	Total Per Diem and Food Cost	=	$ 121,179
	C. Total Personnel Cost	=	$ 534,699
III.	Non-Personnel Cost		
	$413,520 salary x 0.15 of salary	=	$ 62,028
IV.	Equipment		
	A. Equipment		
	1. Construction Equipment		
	$592,600 amortization over 10 years	=	$ 59,260
	2. Hand Tools		
	$35,450 x 0.25 replace third year	=	$ 8,863
	3. Total Equipment	=	$ 68,123

B. P.O.L. Cost

$61,048 x. 1.20	=	$ 73,258

C. Tire Cost

$28,472 x 1.20	=	$ 34,165

D. Repair Parts Costs

$36,380 x 1.20	=	$ 43,656

E. Total Equipment Cost	=	$ 219,202

V. Materials and Supplies

A. Pipe Culverts

179 meters x $22.00 per meter	=	$ 3,938

B. Rock Fords

2,800 bags cement x $3.25	=	$ 9,100

C. Concrete Bridges

1,568 bags cement x $3.25	=	$ 5,096
13 ton re-steel x $600 per ton	=	$ 7,800

D. Explosives

11,200 lbs explosives x $1.20 per lb.	=	$ 13,440
E. Oxygen and Acetylene	=	$ 5,500
F. Total Materials and Supplies	=	$ 44,874

VI. Summary

A. Construction Camp	=	$ 73,200
B. Personnel	=	$ 534,699
C. Non-Personnel	=	$ 62,028
D. Equipment	=	$ 219,202
E. Materials and Supplies	=	$ 44,874
F. Total	=	$ 934,003

(Plus $8,863 for hand tools for self-help roads.)

YEAR ONE

COST SUMMARY

GOJJAM PROVINCE LIGHT CONSTRUCTION UNIT

I. Construction Camps		
$36,600 per camp x 3 camps	=	$ 109,800
II. Personnel		
A. Salary		
$16,800 per month x 12 months skilled	=	$ 201,600
$14,300 per month x 8 months unskilled	=	$ 114,400
Total Salary Cost	=	$ 316,000
B. Per Diem and Food Cost		
135 skilled x $2.25 per day x 288 days	=	$ 87,480
432 unskilled x $0.13 per day x 200 days	=	$ 11,232
Total Per Diem and Food Cost	=	$ 98,712
C. Total Personnel Cost	=	$ 414,712
III. Non-Personnel Cost		
$316,000 salary x 0.15 of salary	=	$ 47,400
IV. Equipment		
A. Equipment		
1. Construction Equipment		
$592,600 amortization over 10 years	=	$ 59,260
2. Hand Tools		
$35,450 hand tools for first year	=	$ 35,450
3. Total Equipment	=	$ 94,710
B. P.O.L. Cost	=	$ 52,784

C. Tire Cost	=	$ 24,016
D. Repair Parts Cost	=	$ 30,192
E. Total Equipment Cost	=	$ 201,702

V. Materials and Supplies

A. Pipe Culverts		
154 meters x $18.00 per meter	=	$ 2,772
B. Rock Fords		
2,416 bags cement x $2.75 per bag	=	$ 6,644
C. Concrete Bridges		
1,352 bags cement x $2.75 per bag	=	$ 3,718
12 tons re-steel x $500 per ton	=	$ 6,000
D. Explosives		
9,667 lbs explosives x $1.00 per lb.	=	$ 9,667
E. Oxygen and Acetylene	=	$ 4,500
F. Total Materials and Supplies	=	$ 33,301

VI. Summary

A. Construction Camps	=	$ 109,800
B. Personnel	=	$ 414,712
C. Non-Personnel	=	$ 47,400
D. Equipment	=	$ 201,702
E. Materials and Supplies	=	$ 33,301
F. Total	=	$ 806,915

(Plus $35,450 for hand tools for self-help roads.)

YEAR TWO

COST SUMMARY

GOJJAM PROVINCE LIGHT CONSTRUCTION UNIT

I. Construction Camps		
$36,600 per camp x 3 camps x 0.50 reusable	=	$ 54,900
II. Personnel		
A. Salary		
$16,800 per month x 1.10 x 12 months skilled	=	$ 221,760
$14,300 per month x 1.10 x 8 months unskilled	=	$ 125,840
Total Salary Cost	=	$ 347,600
B. Per Diem and Food Cost		
135 skilled x $2.25 per day x 288 days x 1.10	=	$ 96,228
432 unskilled x $0.14 per day x 200 days	=	$ 12,096
Total Per Diem and Food Cost	=	$ 108,324
C. Total Personnel Cost	=	$ 455,924
III. Non-Personnel Cost		
$347,600 salary x 0.15 of salary	=	$ 52,140
IV. Equipment		
A. Equipment		
1. Construction Equipment		
$592,600 amortization over 10 years	=	$ 59,260
2. Hand Tools		
$35,450 x 0.25 replace second year	=	$ 8,863
3. Total Equipment	=	$ 68,123
B. P.O.L. Cost		
$52,784 x 1.10	=	$ 58,062

C. Tires

$24,016 x 1.10	=	$ 26,418

D. Repair Parts Cost

$30,192 x 1.10	=	$ 33,211

E. Total Equipment Cost	=	$ 185,814

V. Materials and Supplies

A. Pipe Culverts

154 meters x $20.00 per meter	=	$ 3,080

B. Rock Fords

2,416 bags cement x $3.00 per bag	=	$ 7,248

C. Concrete Bridges

1,352 bags cement x $3.00 per bag	=	$ 4,056
12 tons re-steel x $550 per ton	=	$ 6,600

D. Explosives

9,667 lbs explosives x $1.10 lbs.	=	$ 10,633

E. Oxygen and Acetylene	=	$ 5,000
F. Total Materials and Supplies	=	$ 36,617

VI. Summary

A. Construction Camps	=	$ 54,900
B. Personnel	=	$ 455,324
C. Non-Personnel	=	$ 52,140
D. Equipment	=	$ 185,814
E. Materials and Supplies	=	$ 36,617
F. Total	=	$ 784,795

(Plus $8,863 for hand tools for self-help roads.)

YEAR THREE

COST SUMMARY

GOJJAM PROVINCE LIGHT CONSTRUCTION UNIT

I.	Construction Camps		
	$36,600 per camp x 3 camps x 0.50 reusable	=	$ 54,900
II.	Personnel		
	A. Salary		
	$16,800 per month x 1.20 x 12 months skilled	=	$ 241,920
	$14,300 per month x 1.20 x 8 months unskilled	=	$ 137,280
	Total Salary Cost	=	$ 379,200
	B. Per Diem and Food Cost		
	135 skilled x $2.70 per day x 288 days	=	$ 104,976
	432 unskilled x $0.15 per day x 200 days	=	$ 12,960
	Total Per Diem and Food Cost	=	$ 117,936
	C. Total Personnel Cost	=	$ 497,136
III.	Non-Personnel Cost		
	$379,200 salary x 0.15 of salary	=	$ 56,880
IV.	Equipment		
	A. Equipment		
	1. Construction Equipment		
	$592,600 amortization over 10 years	=	$ 59,260
	2. Hand Tools		
	$35,450 x 0.25 replace third year	=	$ 8,863
	3. Total Equipment Cost	=	$ 68,123
	B. P.O.L. Cost		
	$52,784 x 1.20	=	$ 63,341

C. Tires

$24,016 x 1.20	=	$ 28,819

D. Repair Parts Cost

$30,192 x 1.20	=	$ 36,230
E. Total Equipment Cost	=	$ 196,513

V. Materials and Supplies

A. Pipe Culverts

155 meters x $22.00 per meter	=	$ 3,410

B. Rock Fords

2,418 bags cement x $3.25 per bag	=	$ 7,859

C. Concrete Bridges

1,342 bags cement x $3.25 per bag	=	$ 4,362
12 tons re-steel x $600 per ton	=	$ 7,200

D. Explosives

9,667 lbs explosives x $1.20 per lb.	=	$ 11,600
E. Oxygen and Acetylene	=	$ 5,500
F. Total Materials and Supplies	=	$ 39,931

VI. Summary

A. Construction Camps	=	$ 54,900
B. Personnel	=	$ 497,136
C. Non-Personnel	=	$ 56,880
D. Equipment	=	$ 196,513
E. Materials and Supplies	=	$ 39,931
F. Total	=	$ 845,360

(Plus $8,863 for hand tools for self-help roads.)

YEAR ONE

COST SUMMARY

GEMU GOFA AND GOJJAM PROVINCES

ONE MAINTENANCE UNIT

I.	Personnel		
	A. Salary		
	$7,414 per month x 12 months	=	$ 88,968
	B. Per Diem and Food		
	21 personnel x $2.25 per day x 288 days	=	$ 13,608
	132 personnel x $0.13 per day x 288 days	=	$ 4,942
	C. Total Personnel Cost	=	$ 107,518
II.	Non-Personnel		
	$88,968 salary x 0.15 of salary	=	$ 13,345
III.	Equipment		
	A. Equipment		
	$249,500 amortization over 10 years	=	$ 24,950
	B. P.O.L. Cost	=	$ 30,324
	C. Tire Cost	=	$ 22,664
	D. Repair Parts Cost	=	$ 11,568
	E. Total Equipment Cost	=	$ 89,506
IV.	Materials and Supplies		
	A. Oxygen and Acetylene	=	$ 2,000
V.	Summary of Cost		
	A. Personnel	=	$ 107,518
	B. Non-Personnel	=	$ 13,345
	C. Equipment	=	$ 89,506
	D. Materials and Supplies	=	$ 2,000
	E. Total Cost	=	$ 212,369

YEAR TWO

COST SUMMARY

GEMU GOFA AND GOJJAM PROVINCES

ONE MAINTENANCE UNIT

I.	Personnel		
	A. Salary $7,414 per month x 12 months x 1.10	=	$ 97,865
	B. Per Diem and Food		
	21 personnel x $2.25 per day x 288 days x 1.10	=	$ 14,969
	132 personnel x $0.14 per day x 288 days	=	$ 5,322
	C. Total Personnel Cost	=	$ 118,156
II.	Non-Personnel		
	$97,865 salary x 0.15 of salary	=	$ 14,680
III.	Equipment		
	A. Equipment $249,500 amortization over 10 years	=	$ 24,950
	B. P.O.L. Cost $30,324 x 1.10	=	$ 33,356
	C. Tire Cost $22,664 x 1.10	=	$ 24,939
	D. Repair Parts Cost $11,568 x 1.10	=	$ 12,724
	E. Total Equipment Cost	=	$ 95,969
IV.	Materials and Supplies $2,000 x 1.10	=	$ 2,200
V.	Summary of Cost		
	A. Personnel	=	$ 118,156
	B. Non-Personnel	=	$ 14,680
	C. Equipment	=	$ 95,969
	D. Materials and Supplies	=	$ 2,200
	E. Total Cost	=	$ 231,005

YEAR THREE

COST SUMMARY

GEMU GOFA AND GOJJAM PROVINCES

ONE MAINTENANCE UNIT

I.	Personnel		
	A. Salary $7,414 per month x 12 months x 1.20	=	$ 106,762
	B. Per Diem and Food		
	21 personnel x $2.25 per day x 288 days x 1.20	=	$ 16,330
	132 personnel x $0.15 per day x 288 days	=	$ 5,702
	C. Total Personnel Cost	=	$ 128,794
II.	Non-Personnel $106,762 salary x 0.15 of salary	=	$ 16,014
III.	Equipment		
	A. Equipment $249,500 amortization over 10 years	=	$ 24,950
	B. P.O.L. Cost $30,324 x 1.20	=	$ 36,389
	C. Tire Cost $22,664 x 1.20	=	$ 27,197
	D. Repair Parts Cost $11,568 x 1.20	=	$ 13,882
	E. Total Equipment Cost	=	$ 102,418
IV.	Materials and Supplies $2,000 x 1.20	=	$ 2,400
V.	Summary of Cost		
	A. Personnel	=	$ 128,794
	B. Non-Personnel	=	$ 16,014
	C. Equipment	=	$ 102,418
	D. Materials and Supplies	=	$ 2,400
	E. Total Cost	=	$ 249,626

ANNEX G

SELF HELP ROADS

SELF HELP ROADS

1. Introduction

The Rural Roads Organization will initially provide centrally administered assistance to self-help road construction projects. This assistance will be at a level determined by the availability of qualified manpower and financial resources. As Regional Rural Roads Organizations are established, the self-help program will be decentralized and operate on a regional basis. Self-help roads will be initiated and wholly or largely constructed with the resources of peasant associations and other mass organizations. Generally, these roads will provide local access to the existing road network.

The Rural Roads Organization will provide technical and organizational assistance to projects reviewed and recommended by Revolutionary Development Committees and Rural Roads Committees in the administrative regions. Subject to the availability of resources, grant-in-aid assistance may be provided to projects in the form of hand tools, materials and equipment time. Self-help roads assisted by the RRO will be constructed to RR10 standards and will qualify for inclusion in the RRO maintenance program (with the majority of the maintenance to be undertaken by the PAs). The technical supervisor on each project will be responsible for the overall technical standards of the road, training and supervising local labor supervisors in both construction and maintenance procedures appropriate to the area, and for providing guidance to the participating Peasant Associations in project organization.

2. Background and Current Approaches

Locally organized and financed road building efforts have taken place with increasing frequency in recent decades in Ethiopia. These efforts have been initiated and guided by a variety of cultural leaders and administrators mobilizing differing combinations of local resources and outside assistance. No uniform approach has been followed in these efforts and they met with varying success. Under the previous government many of these projects depended on what amounted to forced labor. The roads constructed varied both in standards and usefulness. One widely cited successful effort is the locally constructed network of low standard roads in Tigre which proved to be extremely effective during the recent drought relief efforts in that area.

Since the beginning of the Revolution self-help projects have been encouraged by the new Government in keeping with its emphasis on local self-reliance. Few of the self-help projects undertaken, however, have received adequate technical assistance. In some areas of the country where Peasant Associations have not been well established and pre-revolutionary local administrators and leaders still exercise power, it appears that "self-help" projects continue to be poorly organized and based on "drafted labor".

Government and voluntary agencies have supported, and in some cases organized, self-help projects with differing combinations of technical, financial and material assistance. A number of projects in drought affected areas have been subsidized through Food-for-Work schemes, many of these administered through EPID. The Settlement Authority has constructed roads into some of its new settlement areas with the labor propsective settlers paid through Food-for-Work.

Many of these so-called "self-help" projects have actually constituted labor-intensive road construction projects, selected by central authorities, and with substantial or total compensation provided for laborers in cash and/or cereal grains. Despite this significant difference from the projects proposed here, these past efforts have demonstrated that projects with similar labor-intensive and organizational characteristics can produce useable roads. Although the organizational capabilities of peasant associations may initially be somewhat weak, it is felt that the provision of organizational guidance and training will compensate for this. Most local officials and Peasant Association representatives consulted have indicated that self-help projects will work if provided technical guidance.

EPID's MPP II proposes a quite similar self-help road assistance scheme. This program would provide technical assistance and grants-in-aid to self-help projects within areas where the MPP II program will operate. These projects would be proposed and organized by Peasant Associations and Cooperatives with no direct compensation for the labor contributed to the projects. Given the similarity in approach of these projects and the apparent limitations on the technical support that EPID will be able to provide these projects,* the coordination or consolidation of this program with the self-help program of the RRO should be agreed upon in those Administrative Regions where RROs will be established.

3. Issues Considered in Project Formulation

The basic requirement for a self-help road project is that the local people want or need a road strongly enough that they are willing to mobilize the considerable resources required for a sustained construction effort. In order to arrive at this decision peasants must be conscious that they, rather than local elites or outside groups, will be the primary beneficiaries of their efforts. Despite well founded suspicions based on past experience and the increased exploitation and alienation of land which might have followed new roads, many rural areas of Ethiopia with established Peasant Associations are now apparently confident that they will benefit from their own efforts.

*The MPP II proposal identifies one Construction Supervisor posted in the Provincial Office as the local technical support for this Project.

However confident and well motivated, few areas of rural Ethiopia possess the technical skills required to plan and construct sound low standard roads. The goal of providing technical assistance and project organizational guidance to self-help projects is to assure that the locally mobilized resources expended on the project--labor, financing and materials--will produce the intended result, a useable road which can and will be maintained.

Despite the apparent incentive of providing substantial direct or indirect compensation for the local labor contributions to road construction, this clearly contradicts the basic premises of self-help projects. The government of Ethiopia does not have the financial resources to pay for the construction of even low-standard roads on the scale that is needed and desired. Dependence on substantial foreign donor assistance for all of its road construction requirements would be politically unacceptable.

The promotion and assistance of self-help projects for areas strongly enough motivated to undertake them not only utilize (and ultimately improve) indigenous resources, but will also increase the confidence and experience of local Peasant Associations.

The willing mobilization of local resources which is required is strongly supported by the policies of the PMAC. Its stress on the organization of democratic peasant associations capable of self reliant activities has been supported by a low tax, high price policy on agricultural production. This has occured at the same time that rent payments and labor tribute to landlords and local elites have been eliminated.

The role of the RRO self-help program should assess the technical feasibility of proposed projects and provide technical and organizational assistance to projects selected for assistance by the Regional Revolutionary Development Committee and the Rural Roads Committee (which may in practice serve as a subcommittee of the RDC). The RRO, initially at the central level and subsequently at the Regional level, will determine how many projects can be assisted in a given year. Proposals for self-help projects should be submitted through woreda and awraja Peasant Associations, depending on the scope of the project, for approval and coordination of the local Peasant Associations which lie along the proposed road. At whatever level coordination of the project would take place, woreda or awraja, the Peasant Association at that level would submit its proposal to the equivalent RDC for approval and recommendation to the Regional RDC. The Regional RDC would be responsible for assigning priorities to all roads proposed by awraja RDCs. If the RRO has staff available within the Region, a reconnaissance report on the technical feasibility of proposed roads should be submitted to the RDC before it decides upon priorities. Most self-help road projects will require the cooperative efforts of a number of Peasant Associations along or near the proposed alignment of the road. The relative motivation of associations is also likely to be

greater the further removed they are from existing roads. It is thus essential that woreda and awraja Peasant Associations and RDCs be involved in selecting as well as coordinating self-help projects.

4. Motivation

Pre-revolutionary social and cultural traditions of collective labor and initiative vary considerably in the project areas. Positive local traditions in these respects are strongest in the highlands of Gemu Gofa, in most of Gojjam and generally lacking in the lowland areas of both Gojjam and Gemu Gofa. The self-help program will have to attempt to carefully assess the motivations and organizational capabilities of local Peasant Associations proposing self-help projects. The judgments of administrators and RDCs at various levels may not always be realistic on these matters. The bias towards overestimating motivation which may enter into the selection of self-help projects for assistance can only be counteracted by self-help teams being aware of approaches to project organization and training suitable to the motivational and organizational level of participating Peasant Associations.

Such subtleties and socio-political concerns may not normally be considered the responsibility of technicians. Awareness of these factors and knowledge of how to deal with them, or who to turn to for advice and assistance, will be critical to the success of self-help teams. As cautioned earlier, the tendency to circumvent Peasant Association structures and officials in favor of more cooperative and perhaps effective structure and individuals should be avoided. The long term success of self-help projects will depend directly on how the projects are carried out.

5. RRO Self-Help Program Organization

The Rural Roads Division has recently initiated a pilot self-help assistance program based on two teams each composed of a construction superintendent and two surveyors operating out of the central RRD office in Addis Ababa. It is too soon to evaluate the effectiveness of this effort. Another self-help project organized by Peasant Associations in Gofa Awraja in Gemu Gofa Administrative Region is being assisted by an expatriate engineer working under the auspices of the RRD. This project has also been recently initiated.

Until the RRO is able to establish decentralized organizations in Administrative Regions, it is likely that most self-help teams will operate out of the Central RRO. Depending on the experience of the two pilot teams now operating, these teams may be variously staffed, ranging from an experienced construction superintendent operating alone to teams including surveying and labor supervision skills. The availability of experienced construction superintendents will be the major constraint on the amount of assistance which the RRO will be able to provide to self-help projects.

The isolation of the self-help projects and varied skills required of construction superintendents assisting these projects makes it essential that these individuals be experienced, self-reliant and well qualified. Newly trained personnel should be posted to projects where they can gain additional practical experience before being assigned as advisors to self-help teams.

The establishment of RRO offices in Administrative Regions will greatly improve the effectiveness of the self-help program and allow for regional decentralization of skills supplementary to those of construction superintendents.

If three of these teams and support staff in an Administrative Region can be provided, they should be able to assist approximately 15 self-help projects a year. The output of a regional self-help program will, however, be dependent on the number, length and technical difficulty of specific roads.

It is essential during the centralized phase at the RRO, that self-help teams be able to operate with the full support of the Chief Administrators of Administrative Regions and the Regional RDC. The RRO should establish working relationships with these authorities as quickly as possible and begin to involve them in the selection and coordination of self-help projects. As soon as an RRO office is established in a region, the local RDC structure should be fully involved in and fully assume the responsibility for selecting self-help projects for assistance within the resource limitations of the regional self-help program.

Although the responsibility for actually mobilizing and organizing local resources and labor for self-help projects must lie with woreda, awraja and local Peasant Associations, the RRO self-help team should provide advice and guidance on the resources required for roads. This should minimally include the total person-days of labor, and the types of tools and materials required. Information should also be provided on alternative methods of organizing the construction of the road, reasonable ratios of laborers to team leaders and foremen, and the amount of time which will be required for training these local leaders and foremen. These guidance activities must be carried out well in advance of the project to allow the Peasant Associations involved to reach the required decisions, select project leaders, and carry out the necessary organization. If possible, the RRO should establish a training program for the project leaders.

Self-help teams will be responsible for final alignment, technical project planning, training of local construction leaders and overall construction supervision for the project. In addition, some construction team leaders, selected by Peasant Associations with the

advice of self-help teams, will be trained as local maintenance leaders. These leaders will be trained in the same skills and responsibilities as are local Peasant Association members under rural road projects. These will minimally involve the cleaning and repairing of drainage ditches, spot repairs to surfacing and surveillance and checking of erosion. Each local association's leader will be assigned a specific section of the road.

Low standard roads can be built entirely with labor and hand tools, but in some circumstances only with the greatest difficulty. Certain external project inputs should, if possible, be supplied by the RRO to self-help projects. These include explosives for blasting, earth moving equipment (farm tractors and tipping trailors) for sections requiring materials to be bought from excessive distances, and heavy equipment for extensively difficult sections.

It is unlikely that this assistance can be provided on a regular basis until RRO Regional offices are established. In the interim, project by project arrangements will have to be made, drawing on equipment available from other road projects in the region. Self-help team leaders will be responsible for limiting equipment use to the absolute minimum and for assuring that work is planned to allow the maximum use of equipment in the shortest possible time.

6. Project Organization - The Role of Mass Organizations

Peasant Associations will bear the primary burdens and responsibilities for self-help road projects. With the exceptions of determining regional priorities and technical aspects of projects (including standards), Peasant Associations must decide on the organization structure and construction schedule for the project. Depending on the intensity of the construction schedule, RRO self-help teams will have to determine how they can best allocate their time to each project.

If all of the organizational elements in self-help schemes are to work effectively together, it is essential that enough lead time be allowed between the proposal of project for assistance and the beginning of project construction. Ideally, projects should be proposed and priorities assigned by the beginning of the rainy season before the construction project is to begin. This timing would necessarily vary between areas of the country, but should always allow several months between the selection of projects and the planned commencement dates.

This period will allow the Peasant Associations undertaking the project to fully consider and decide upon a number of issues relating to project organization:

a. The overall organization of the project. What division of authority and responsibilities will be made between the higher level Peasant Association groupings (woreda or awraja) and the local Peasant Associations or cooperatives which are participating in the projects?

b. What part, if any local Peasant Associations within the woreda or awraja association, but not on or near the proposed road, will play in the project.

c. How contributions to the project labor--finances and materials--will be allocated among the participating Peasant Associations and how actual contributions will be accounted for.

d. The phasing of project construction. Will all participating Peasant Associations begin work at once along the entire alignment, or will construction proceed from one end of the road to the other? This decision should involve consultation with the self-help team since the training and construction supervision requirements of each approach are radically different.

e. How will labor be mobilized, scheduled and sustained for the project? There should be some uniform policy on the level and scheduling of labor contributions to construction. Will all members work together for continuous periods, or will labor constructions be staggered to maintain a smaller but continuous labor supervision and training needs? The self-help team should be consulted.

f. How will labor team leaders, foremen or other responsible project leaders be chosen by Peasant Associations? Depending on the organization and scheduling of the project, these positions may involve taking considerable time and effort away from the individual's own agricultural and domestic responsibilities. Local Peasant Associations may wish to provide collective assistance to these individuals for carrying out these other duties.

g. How will the labor contributions within local Peasant Associations be allocated and accounted for? However labor contributions are organized, it will be more efficient if minimal labor units are composed of the same people over time.

h. Hand tools will in most cases be provided by RRO. How will the PAs allocate and maintain controls over the tools?

i. What contributions will women and children make to construction projects? It may be useful to involve women cadres of the POMOA and women's association leaders in discussions of these issues to ensure that women can participate fully and do not have an undue burden of added agricultural and domestic labor shifted on them.

The list is suggestive of the range of issues which Peasant Associations will have to settle in advance of beginning a project. It is assumed that local Peasant Associations can best judge the scheduling of construction work to minimize disruptions to agricultural work and other Association activities.

Self-help teams should assist participating Associations at higher and local levels in carrying out periodic progress reviews of the project including possible modifications in its organization and scheduling.

During the course of the construction project, participating Peasant Associations should select, in consultation with the self-help team, one or more construction leaders for training as maintenance leaders. Since these individuals may be provided with compensation for their duties after the road is included in the RR Maintenance Program, the Peasant Association should also decide whether this compensation will go to the individual or the Association.

The Association will also have to determine how to mobilize the labor which will be needed to work with the maintenance leader.

7. Technical Feasibility of Self-Help Roads

Self-help roads which are assisted by the RRO will be built to conform to RR10 standards. It is anticipated, however, that greater discretion may be exercised in deviating from maximum grade and width of cut section requirements, so long as the resulting road remains safely passable on a seasonal basis for the intended types of vehicle traffic. Generally, however, the same technical criterial and problems discussed for RR10 roads will apply to self-help roads.

Two self-help road projects were inspected by consultants in the preparation of this project; the Bako-Jege-Shombie project in July 1976 and the Konso access project in March 1977.

Both projects were judged somewhat "fragile" with the Bako project having compaction and surfacing deficiencies and the Konso project lacking longitudinal drainage. Both roads were passable, however, and given the continual maintenance requirements of all RR10 roads, appeared to be viable examples of what can be accomplished through self-help projects.

a. Technical Assistance

The common need for all self-help projects will be "know-how". This will be provided by the RRO in the person of an experienced construction supervisor who can direct the planning and construction of the project, as well as teach locally relevant road building skills. Supervisors must be able to explain the need for a uniform roadway formation (typical cross section), reasonable horizontal and vertical geometry, longitudinal and transverse drainage and spot surfacing. Above all, he must be able to select an alignment which will result in an optimum combination of least effort and cost compatible with RR10 standards.

An experienced supervisor may be complimented with other expertise when necessary. These skills may include:

1. Surveyors
2. Carpenters and masons (ford construction)
3. Soils and materials engineer
4. Drainage engineer
5. Bridge/culvert engineer (only when absolutely necessary)

So long as self-help teams are operating out of the central RRO, it will be possible to provide only the most necessary of these skills to a few self-help projects. Once RRO operations are established in an Administrative Region it will be more feasible and economical to draw upon a wider range of these skills as needed and to increase the number of assisted projects.

b. Road Building Task Rates

It will be important for construction supervisors to be able to accurately advise Peasant Associations on the likely duration and labor requirements of a road project. The RRO should supply supervisors with detailed task-rate schedules for various conditions, assuming minimal or no equipment support, based on locally organized self-help project experience. Such a task-rate schedule from a neighboring country is presented as an example.

Road Building Tasks Daily Task Rates

and Related Equipment Use

Task Description	Rate 1/	Related Equipment
1. Clearing (10m width)	30 mandays/km	hand tools
2. Grubbing (10m width)	30 mandays/km	" "
3. Stone Removal	30 mandays/km	" "
4. Topsoil Removal	50cm/manday	" "
5. Excavation in Bulk	4cm/manday	" "
6. Ditching	4cm/manday	" "
7. Slipping	2.5cm/manday	" "
8. Spreading (Shaping)	8.4cm/manday	" "
9. Ford Construction	1 Ford/30 mandays 2/	" "
10. Compaction (spots)	30-50 mandays/km	Vibrating Roller (hand) and hand Rams.
11. Select Material Surfacing	270 mandays/km	Haul by tractor & trailer
12. Hauling Earthworks (100m)	4.5cm/manday	Wheelbarrows (downhill)
13. Crush stone by hand	0.1cm/manday	Handtools
14. Drainage Pipe Fabrication (30 in. long)	2 rings/manday	Hand tools

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1/ All rates are related to "work time" which is found to be about .75 total time. Rates given in mandays per kilometers are job averages since amount of work changes in different kilometers.

2/ For 18" diameter culvert. 24" diameter requires 150% of mandays, etc.

Source: Appropriate Technology Unit Findings and SPB (Kenya)

cm = cubic meter

c. Need for Grant-in-Aid Assistance

Although almost all road building tasks can conceivably be accomplished entirely with labor, some of these are almost impossible to perform well manually or will be so time-consuming as to be impractical. Such tasks include:

1. Hauling a distance over 100 meters:

   a. Earth
   b. Select material surfacing
   c. Supplying water for soil moisture control
   d. Miscellaneous: Masonry, rock, cement, reinforcing steel, timber, spare parts, POL

2. Excavation of boulder (or greater) sized rocks
3. Compaction, other than spot compaction
4. Cut in rock (dynamite blasting required)

The RRO should have the capability to provide assistance in the above areas. Vigilance will be needed, however, to keep construction standards to a minimum and to screen each request for assistance carefully in order to provide equipment only when absolutely necessary. Self-help roads will be far more likely to meet the desired RR10 minimum standards if appropriate equipment can be provided to projects on a temporary basis.

d. Maintenance

Completed self-help roads which meet RR10 standards will qualify for the RRO maintenance program. Primary maintenance responsibility will fall to Peasant Association members trained for this purpose during the construction projects. Back-up support will have the same need for continual maintenance of the RR program roads themselves.

8. Felege Neway to Laha Self-Help Project

The most ambitious self-help road project about which detailed information could be obtained is a project in Gofa Awraja of Gemu Gofa. This effort, presently involving over 20 local Peasant Associations, proposes to construct an RR10 road from Felege Neway via Bulki and Belta to Laha. A branch road from Belta will go south to Fire Hiwot. Work is now underway on the 25 km. section between Bulki and Belta in the highlands.

This project is being assisted by an expatriate engineer working with the Gofa Development Project (Gofa dep) sponsored by CIDR (Centre International de Development et de Recherche) and T.D.N.F. (Terre des Hommes-Franch).

With funding from their own organizations, the Relief and Rehabilitation Commission, PMGSE and the EEC, a group of some 10 expatriates is carrying out an "integrated rural development" activity involving a total of 39 Peasant Associations. Focused around Felege Neway, the awraja center of Gofa, programs are underway in basic health, agricultural extension, cooperative organizations and infrastructure building. The self-help road is the major effort in the latter program.

The organization and strengthening of Peasant Associations in Gofa Awraja generated and has continued to meet with strong opposition from former landlords. This opposition was supported, until recently, by a sympathetic Awraja Administrator, local police and large merchants in Felege Neway. Despite, and perhaps because of, this opposition, Peasant Associations have grown strong enough to begin undertaking a number of projects for the development of the area. The "Gofadep" team of expatriates operates with the Office for Mass Organizational Affairs, who was formally Awraja Coordinator for the Zemetcha Campaign. The road being constructed, apparently is into a previously inaccessible area of the highlands east of Bulki, which is connected by a recently improved road to Felege Neway. The decision to construct this road now rather than other proposed roads, is based on its potential impact and the motivation level of the peasant associations involved. The construction is being carried out now entirely with labor. Local Peasant Associations decided to mobilize labor on a system of each member working one day a week on the road.

In each Peasant Association a different labor team is responsible for working each of the six work days. Each team is named for its days. Depending on the membership of the Associations, these teams vary from about 20 to over 30 men in size. Each Association has been assigned a segment of the road, averaging about two kilometers.

Training of labor team leaders is continuing as the work proceeds. Unit leaders who are Ethiopian staff members of Gofadep, are also being trained to be responsible for supervising the work of five local Peasant Associations. Once these unit leaders are trained they will be responsible for training new Peasant Associations along the project. New Associations are trained and begin work in the project as soon as the preceding Association is trained. Gofadep has provided each Peasant Association with an assortment of some 40 hand tools.

In the six weeks that the project has been underway, the rate of attendance by foremen has been about 90 percent. Productivity thus far has been about 1 meter per (5 hour) manday in fairly rugged highland terrain. At this rate it will take a small Peasant Association (120 members) about 19 continuous weeks of work to complete a two kilometer section.

The alignment of the road is being surveyed and staked by the expatriate engineer. RR10 standards are being followed, with the exception that curves are being designed to RR30 standards (minimum 15 meter radius). Since lines and clearance standards are being deviated from in cut sections in order to reduce erosion by leaving as much natural growth in place as possible.

There is much for the RRO to learn from this utilization of Gemu Gofa PAs for self-help road construction.

ANNEX H

LOGICAL FRAMEWORK MATRIX

ANNEX H

AID 1020-20 (1-72)

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 1977 to FY 80
Total U.S. Funding $8,000,000
Date Prepared: July 6, 1977

Project Title & Number: Rural Roads 663-0180

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program or Sector Goal: The broader objective to which this project contributes: Assist Ethiopia's rural poor gain access to markets for their agricultural production and to enable them to participate increasingly in the Ethiopian Government's rural development programs.	Measures of Goal Achievement: 1. Actual spread of Government Programs such as MPP II, NFE, Rural Health along rural roads constructed under this project. 2. Measures of increased marketing of agriculture production in project areas. 3. Increased involvement of rural population representatives in rural road (including self-help roads) programs.	1. EPMG Ministry and Agency reports. 2. Ag. Marketing Corporation reports from regional marketing centers. 3. Records of PRRC meetings and PRDC meetings.	Assumptions for achieving goal targets: 1. MPP II, other EPMG production and marketing projects, and social services programs develop as currently planned utilizing the rural roads being constructed.
Project Purpose: Establish a functioning capability within the EPMG to construct low cost, low standard rural roads; to make progress toward decentralization of rural roads construction and maintenance to provincial offices in Gemu Gofa and Gojjam, to assist Peasant Associations to construct and maintain self-help roads.	Conditions that will indicate purpose has been achieved: End of project status. 1. Rural Roads Organization established and functioning. 2. Provincial Rural Roads Offices established and 75% staffed by Year Three. 3. RRO providing technical and equipment assistance to Peasant Associations for self-help road construction and maintenance.	1. Official Proclamation Annual RRO report. 2. Observation and staffing charts. 3. Quarterly work reports from PRROs.	Assumptions for achieving purpose: 1. EPMG meets its budgetary commitments. 2. RRO is provided satisfactory support from Highways Organization. 3. Peasant Associations able to organize sufficiently to construct and maintain self-help roads to RR10 standard.
Outputs: 1. Rural Roads Construction and Maintenance Units established in Gemu Gofa and Gojjam. 2. Assistance being provided to Peasant Associations for self-help roads. 3. Rural roads constructed. 4. Rural roads maintained. 5. Self-help roads constructed. 6. Self-help roads maintained.	Magnitude of Outputs: 1. 1 CU and 1 MU established and functioning in each province by Year Two (including Augmentation Units.)2. Self-help units (part of augmentation unit) established, staffed & working on approximately 4 self-help road projects (approx. 100 km) at end of Year3. 3. Gemu Gofa:336 km by end Yr. 3. Gojjam: 290 by end Yr. 3. 4. Gemu Gofa 370 kms being maintained by Yr. 3. Gojjam: 307 kms being maintained by Yr. 3. 5. 90-100 km of self-help roads being constructed annually by Yr. 3in each province. 6. 250 km of self-help roads being maintained annually by Year 3.	1. RRO reports and on-site observation. 2. PRRO reports and on-site observation. 3. PRRO reports and on-site observation. 4. PRRO reports and on-site observation. 5. PRRO reports and on-site observation. 6. PRRO reports and on-site observation.	Assumptions for achieving outputs: 1. Equipment available and arrives in country approx. one year from time of ProAg signing. 2. POL is available in sufficient quantities at project sites on timely basis. 3. No excessive labor unrest. 4. Unskilled labor available for Construction and Maintenance Units.
Inputs: US 1. Local cost contribution for facilities construction. 2. FX for road equip. 3. FX for tires, replacement parts. 4. LC for hand tools. 5. FX for technical expertise. 6. FX for 3rd country training. EPMG: 1. LC for contribution for facilities construction. 2. Personnel and non-personnel expenses. 3. FX for POL. 4. LC for materials and supplies.	IMPLEMENTATION TARGET (Type/Quantity) US 1.66% of PHQ construction. 100% of construction Camp costs. 2. 170 pcs. of rd. bldg. eqpt. 3. Eqpt., vehicle spares. 4. Hand tools for constr., maintenance units, self-help roads. 5. 3 LT and 4 ST tech. 6. 27 3-6 mo. trg. course EPMG 1. 33% of PHQ constr. costs. 100% of CHQ constr.costs 2. Personnel costs. 3. POL($1.3million) 4. Materials and supplies.	AID 1-6 AID Project Manager reports. EPMG 1-3 RRO reports, Min. of Finance Budget actuals, AID Project Manager reports.	Assumptions for providing inputs: 1. No unusual delays in satisfaction of CPs, bidding, review of and awards of bids and shipment of equipment. 2. Port clearance of commodities on timely basis. 3. Hand tools in sufficient quantities available in country. 4. Personnel available according to schedule and willing to be assigned to Gemu Gofa and Gojjam. 5. In country materials and supplies available.

ANNEX I

STATUTORY CHECKLIST

ANNEX I

STATUTORY CHECKLIST

I. Country Checklist

A. General Criteria for Country

1. FAA Sec. 116. Can it be demonstrated that contemplated assistance will directly benefit the needy? If not, has the Department of State determined that this government has engaged in consistent pattern of gross violations of internationally recognized human rights?	Yes, the assistance will directly benefit the needy.
2. FAA Sec. 481. Has it been determined that the government of recipient country has failed to take adequate steps to prevent narcotics 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
3. FAA Sec. 620(a). Does recipient country furnish assistance to Cuba or fail to take appropriate steps to prevent ships or aircraft under its flag from carrying cargoes to or from Cuba?	No
4. FAA Sec. 620(b). If assistance is to a government, has the Secretary of State determined that it is not controlled by the international Communist movement?	No

5.	FAA Sec. 620(c). If assistance is to 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) debt is not denied or contested by such government?	No
6.	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. Nationalization of American owned assets has occured but a government organization has been established to review and take action on the claims of U.S. and other foreign owners for compensation.
7.	FAA Sec. 620(f); App. Sec. 108. Is recipient country a Communist country? Will assistance be provided to the Democratic Republic of Vietnam (North Vietnam), South Vietnam, Cambodia or Laos?	Ethiopia is a self-proclaimed socialist state. No assistance to these countries is presently contemplated or anticipated.
8.	FAA Sec. 620(i). Is recipient country in any way involved in (a) subversion of, or military aggression against, the United States or any country receiving U.S. assistance, or (b) the planning of such subversion or aggression?	No
9.	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

10. FAA Sec. 620(l). If the country has failed to institute the investment guaranty program for the specific risks of expropriation, inconvertibility or confiscation, has the AID Administrator within the past year considered denying assistance to such government for this reason?	No
11. FAA Sec. 620(o). Fishermen's Protective Act, Sec. 5. If country has seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters, a. has any deduction required by Fishermen's Protective Act been made? b. has complete denial of assistance been considered by AID Administrator?	N.A.
12. FAA Sec. 620(q); App. Sec. 504. (a) Is the government of the recipient country in default on interest or principal of any AID loan to the country? (b) Is country in default exceeding one year on interest or principal on U.S. loan under program for which App. Act. appropriates funds, unless debt was earlier disputed, or appropriate steps taken to cure default?	No
13. FAA Sec. 620(s). What percentage of country budget is for military expenditures? How much of foreign exchange resources spent on military equipment? How much spent for the purchase of sophisticated weapons systems? (Consideration of these points is to be coordinated with the Bureau for Program and Policy Coordination, Regional Coordinators and Military Assistance Staff (PPC/RC.)	a. 23% b. During the period July 1975-June 1976 an estimated $65 millio in FX was spent for off-shore military purchases. c. Figure almost impossible to determine. Amount spent on U.S. source "sophisticated weapons" is $53 million.

14. 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
15. 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?	Ethiopia is not in arrears.
16. FAA Sec. 620A. Has the country granted sanctuary from prosecution to any individual or group which has committed an act of international terrorism?	No
17. FAA Sec. 666. Does the country object, on basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. there to carry out economic development program under FAA?	No
18. FAA Sec. 669. Has the country delivered or received nuclear reprocessing or enrichment equipment, materials or technology, without specified arrangements on safeguards, etc.?	No
19. FAA Sec. 901. Has the country denied its citizens the right or opportunity to emigrate?	Emigration statistics are not known. The Government has apparently made it more difficult for some Ethiopian citizens to leave Ethiopia.

B. Funding Criteria for Country

1. Development Assistance Country Criteria

a. FAA Sec. 102(c),(d). Have criteria been established, and taken into account, to assess commitment and progress of country in effectively involving the poor in development, on such indexes as: (1) small-farm labor intensive agriculture, (2) reduced infant mortality, (3) population growth, (4) equality of income distribution, and (5) unemployment.	Such criteria are employed as a matter of course in US-funded economic development projects. Ethiopia has established a disaster early warning system which employs nutrition and infant mortality statistics. A project with the Institute of Development Research is being designed to help Ethiopia collect and measure statistics on these and related criteria.
b. FAA Sec. 201(b)(5),(7) & (8); Sec. 208; 211(a)(4), (7). Describe extent to which country is:	
(1) Making appropriate efforts to increase food production and improve means for food storage and distribution.	1. Ethiopia is in midst of planning national small farmer production program (Minimum Package II), to follow on recently completed phase one program. IBRD-financed grain storage and marketing project scheduled for authorization in near future.
(2) Creating a favorable climate for foreign and domestic private enterprise and investment.	2. Very little being done to create favorable climate for private investment. Movement is in other direction - toward more government control of enterprises.
(3) Increasing the public's role in the developmental process.	3. Peasant and Urban Dwellers Associations have been created and considerable local authority is in process of being devolved to these groups including decision making on local development projects.

(4) (a) Allocating available budgetary resources to development.	4. (a) Budgetary allocations for development projects have increased considerably since advent of EPMG over rates of former Imperial Government.
(b) Diverting such resources for unnecessary military expenditure and intervention in affairs of other free and independent nations.	(b) While military activities is up, no clear case can be made that development allocations are any less than they would have been. (See Addis-4105 of July 1, 1977).
(5) Making economic, social, and political reforms such as tax collection improvements and changes in land tenure arrangements, and making progress toward respect for the rule of law, freedom of expression and of the press, and recognizing the importance of individual freedom, initiative, and private enterprise.	5. Ethiopia has instituted a land reform program which has totally ended the former class system and tenancy which was as principal constraint to rural development. Freedoms of expression, press and individual freedoms not highly regarded by Ethiopian Government and U.S. and other countries have criticized EPMG for this.
(6) Otherwise responding to the vital economic, political, and social concerns of its people, and demonstrating a clear determination to take effective self-help measures.	6. EPMG clearly desires rural development of lot of poor majority and increased participation with heavy reliance on self-help.
c. FAA Sec. 201(b), 211(a). Is the country among the 20 countries in which development assistance loans may be made in this fiscal year, or among the 40 in which development assistance grants (other than for self-help projects) may be made?	Yes.
d. FAA Sec. 115. Will country be furnished, in same fiscal year, either security supporting assistance, or Middle East peace funds? If so, is assistance for population programs, humanitarian aid through international organizations, or regional programs?	No.

2. Security Supporting Assistance Country Criteria	N.A.
a. FAA Sec. 502B. Has the country engaged in a consistent pattern of gross violations of internationally recognized human rights? Is program in accordance with policy of this section?	N.A.
b. FAA Sec. 531. Is the Assistance to be furnished to a friendly country, organization, or body eligible to receive assistance?	N.A.
c. 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.

II. Project Checklist

A. General Criteria for Project

1. App. Unnumbered: FAA Sec. 653(b)

(a) Describe how Committees on Appropriations of Senate and House have been or will be notified concerning the project;	FY 1976 CP. p. 30, FY 1977 CP. pp. 21,26,28.
(b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than $1 million over that figure plus 10%)?	Yes.

2. FAA Sec. 611(a) (1). Prior to obligation in excess of $100,000, will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?	(a) Yes. (b) Yes.
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?	Establishment of Rural Roads Organization as official Ethiopian Government Agency has been approved b Council of Ministers. Official Proclamation to this effect has n yet been issued but is anticipated shortly.
4. FAA Sec. 611(b); App. Sec. 101. If for water or water-related land resource construction, has project met the standards and criteria as per Memorandum of the President dated Sept. 5, 1973 (replaces Memorandum of May 15, 1962; see Fed. Register, Vol 38, No. 174, Part III, Sept. 10, 1973)?	N.A.
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 the country's capability effectively to maintain and utilize the project?	Yes.
6. FAA Sec. 209, 619. Is project susceptible of execution as part of regional or multi-lateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. If assistance is for newly independent country, is it furnished through multi-lateral organizations or plans	No. Nature of project does not lend itself to regional or multilateral execution.

to the maximum extent appropriate?

7. FAA Sec. 601(a): (and Sec. 201(f) for development loans). 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; (c) encourage development and use of co-operatives, 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) Project is aimed at small farmer in remote areas and will have an insignificant effect on international trade.

(b) There will be some beneficial effects on small private traders in the rural areas and small-scale local entrepreneurs as area incomes tend to use.

(c) The project will foster the growth of rural cooperatives composed of groups of Peasant Associations for the purpose of storage and marketing.

(d) Project will foster development of small private truckers, bus owners, etc.,Will also likely improve position of state-run trading corporation, however.

(e) Agricultural practices will be modernized via improved extension services, introduction of fertilizer, pest control, etc.

(f) Project will have no effect on trade unions.

8. FAA Sec. 601(b). Information and conclusion 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).

Project will utilize U.S. road building equipment and an American firm to provide technical expertise.

9. FAA Sec. 612(b); Sec. 636(h). 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 to meet the cost of contractual and other services.	Ethiopian Government is contributing more than 50% of the total project costs. U.S. will pay U.S. equipment suppliers and technical assistance firm in U.S. dollars. U.S. does not own significant amounts of Ethiopia currency.
10. FAA Sec. 612(d). Does the U.S. own excess foreign currency and, if so, what arrangements have been made for its release?	No.

B. Funding Criteria for Project

1. Development Assistance Project Criteria

a. FAA Sec. 102(c); Sec. 111; Sec. 281a. Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production, spreading investment out from cities to small towns and rural areas; and (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions?	(a) Project aimed directly at extending access to economy at local level by providing low cost access roads to hundreds of thousands of rural peasant farmers. Labor intensive construction and maintenance of these roads and encouragement of self-help road building are integral parts of the project. Project should yield increased disposable income to in rural areas affected by fosterin increased production through introduction of"market pull". (b) Development of Peasant Associations is already far advanced. Project will foster grouping of PAs into marketing coops which is part of separate Ethiopian Government program. Decision re local road priorities will eventually be responsibility of local representative body. Provincial Rural Roads Committee.

b. FAA Sec. 103, 103A, 104, 105, 106, 107. Is assistance being made available: (include only applicable paragraph-- eg., a, b, etc.-- which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source.)	These roads required to open up virtually inaccessable rural Ethiopia - one of most roadless areas in Africa. Roads being sited to coordinate with agriculture production programs, introduction of fertilizer, extension, storage and marketing. Hundreds of thousands of rural farm families will gain access to money economy for first time, and Ethiopia's potential food surplus areas will be able to export increased amounts of foodstuffs to food deficit areas of the country decreasing reliance on foreign donors for foodstuffs for drought-prone populations.
c. FAA Sec. 110(a); Sec. 208(e). Is the recipient country willing to contribute funds to the project, and in what manner has or will it provide assurances that it will provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least-developed" country)?	Ethiopia will finance more than half the costs of this project. It is sufficiently high priorit that the Government is willing to commit the personnel and financial resources of this magnitude in order to speed achievement of the objective: a relatively rapid expansion of rural roads network. Budget for first year of 5-year effort has already been approved at the level requested by the Road Authority.
d. 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?	This project combines Capital and Technical components, both grant financed. The disbursements on the Capital side will be 90-95% completed in 3 years. For technical assistance disbursements will be over about 4 years. A request for a waiver of the three year disbursement period is to be proposed.

e. FAA Sec. 207; Sec. 113.
Extent to which assistance reflects appropriate emphasis on: (1) encouraging development of democratic, economic, political, and social institutions; (2) self-help in meeting the country's food needs; (3) improving availability of trained workers-power in the country; (4) programs designed to meet the country's health needs; (5) other important areas of economic, political, and social development, including industry; free labor unions, cooperatives, and voluntary agencies; transportation and communication; planning and public administration; urban development, and modernization of existing laws; or (6) integrating women into the recipient country's national economy.

(1) Project will increasingly involve provincial-level elected representatives of Peasant Associations in determining future road construction programs of the RRO and of the local PAs themselves (self-help roads).

(2) Project will help increase small farmer production and movement of foodstuffs from food surplus to food deficit areas of the country.

(3) Project will create jobs for several thousand rural people in road construction and maintenance programs.

(4) Expansion of rural health facilities will be fostered by the road construction program.

(5) Project will assist in creation and viability of proposed marketing cooperatives and will create the opportunity for increased local participation in development related decision-making.

(6) Project will enhance role of women in economy by improving local markets where women are active participants, by fostering increased income for women farmers, by enabling educational opportunities to be expanded to rural women (and there exist an Ethiopian Government plan to provide increased education to rural women) and fostering improved access to health and family planning services.

f. 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 institutional development; and supports civic education and training in skills required for effective participation in governmental and political processes essential to self-government.	Roads to be built largely based on requests by Provincial Rural Roads Committees. In future, Provincial Revolutionary Development Committee will be influenced in deciding which roads will be built, etc. Whole rationale of project is to decentralize rural roads decision-making to provincial level with major input from locally elected representatives of local population.
g. FAA Sec. 201(b) (2)-(4) and -(8); Sec. 201(e); Sec. 211(a) (1)-(3) and-(8). 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; or of educational or other institutions directed toward social progress? Is it related to and consistent with other development activities, and will it contribute to realizable long-range objectives? And does project paper provide information and conclusion on an activity's economic and technical soundness?	Yes. Project, in concert with other development activities will make major contributing to rural development in Ethiopia. By improving rural access other development and social programs will be able to reach considerably increased numbers of the rural poor. Projects such as Minimum Package II, non-formal education and rural health are already beginning implementation or are in the planning stage. The PP contains information and conclusions on the project's economic and technical soundness.
h. FAA Sec. 201(b) (6); Sec. 211(a) (5), (6). Information and conclusion on possible effects of the assistance on U.S. economy, with special reference to areas of substantial labor surplus, and extent to which U.S. commodities and assistance are furnished in a manner consistent with improving or safeguarding the U.S. balance-of-payments position.	Project will have only small effect on US economy. All procurement is U.S. or host country with only insignificant off-shelf procurement of CODE 935 commodities with exception of one or two equipment items (tipping trailers) not currently manufactured in U.S. But effect will be minimal since most goods and services being provided by U.S. firms.

ANNEX J

CERTIFICATION PURSUANT TO FAA SECTION 611 (e)

ETHIOPIA RURAL ROADS PROJECT

CERTIFICATION PURSUANT TO FAA SECTION 611 (e)

I, Princeton Lyman, the principal officer of the Agency for International Development in Ethiopia, having taken into account, among other things, the maintenance and utilization of projects in Ethiopia previously financed or assisted by the United States, the demonstrated capacity and willingness of the Government of Ethiopia to continue to improve maintenance of its road network and the assistance provided by other donors to expand and improve the training of construction and maintenance personnel, do hereby certify that in my judgement the Government of Ethiopia has the capability in terms of both financial and human resources to effectively maintain and utilize the assistance provided under the Rural Roads Project.

Signed: Princeton Lyman
Princeton Lyman
Director

Date: July 14, 1977

ANNEX K

BORROW/GRANTEE APPLICATION FOR ASSISTANCE

ቁጥር፡ Ref. No. 88/RW/A1/7

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Addis Ababa, Date 15 JUL 1977

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sional Military Government of Socialist Ethiopia

PLANNING COMMISSION

P. O. Box 1037 - Addis Ababa

Mr. Princeton Lyman
Director
US AID Mission to Ethiopia
P. O. Box 1014
Addis Ababa

Dear Mr. Lyman,

As you know the Provisional Military Government of Socialist Ethiopia has long regarded the expansion of the present network of rural roads to be among our most important development priorities. To this end the Government has prepared a five-year Rural Roads Program as part of the overall Highway Sector Program for the period EFY 1970-1974.

Of the estimated total cost of the national Rural Roads Program of Birr 256.4 million it is anticipated that the Government will finance approximately 54.5 percent and that outside assistance will be sought for the remaining 45.5 percent.

The Government is aware of AID's long-standing interest in rural road development in Ethiopia and is desirous of AID's continued participation in the Rural Roads Program as it emerges from the planning stage and into the implementation stage.

The Government's Program is contained in the Ethiopian Road Authority's document entitled "Highway Sector Program EFY 1970-1974 Rural Road Component" dated January 1977. It is proposed that AID participate in the implementation of this Program by assisting principally in the rural road construction and maintenance program in two of Ethiopia's 14 Administrative Regions--Gamo Gofa and Gojjam and, in addition, providing selective assistance at the central level.

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nal Military Government of Socialist Ethiopia
PLANNING COMMISSION
P. O. Box 1037 - Addis Ababa

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Addis Ababa Date

Assistance is requested in the following categories: equipment and spare parts, technical expertise, training and support for selected local costs. The details of this assistance would be mutually agreed to during discussions prior to signing of the Project Grant Agreement.

I look forward to your earliest reply.

Sincerely yours,

Addis Anteneh
D/Commissioner

cc: Ato Yusuf Ahmed
Minister of Transport & Communications

Ato Asfaw Damte
Permanent Secretary
Ministry of Finance

Ato Shiferraw Demissie
General Manager
Ethiopian Road Authority
Addis Ababa

ANNEX L

DRAFT PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMANT OF FUNDS

A.I.D. under the project shall have their source and origin in the Cooperating Country or in the United States except as A.I.D. may otherwise agree in writing. Ocean Shipping financed under the Grant shall be procured in any eligible source country except the Cooperating Country.

b. Prior to any disbursement, or the issuance of any commitment documents under the Project Agreement, Grantee shall furnish in form and substance satisfactory to A.I.D., evidence that a rural roads organization capable of carrying out substantial road construction is operational and functioning.

c. Prior to any disbursement, or the issuance of any commitment documents under the Project Agreement to finance contracts for construction of the procurement of equipment, Grantee shall furnish A.I.D. copies of such contracts in form and substance satisfactory to A.I.D.

d. Grantee shall covenant that to the maximum practicable extent, it shall utilize its equipment now located in Gojam and Gemu Gofa Provinces for road construction under the rural roads organization.

e. Paragraph (a) hereof notwithstanding the procurement of tipping trailers having their source and origin in any country

Ethiopia - Name of Project: Rural Roads

Number of Project: 663-0182

Pursuant to Part I, Chapter 1, Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize a Grant to Ethiopia, the "Cooperating Country", of not to exceed eight million United States Dollars ($8,000,000) the (Authorized Amount") to help in financing certain foreign exchange and local currency costs of goods and services required for the project as described in the following paragraph. The project consists of the provision of goods and services, including technical assistance to develop the Grantee's capability to build rural roads (hereinafter referred to as the "Project"). The entire amount of the A.I.D. financing herein authorized for the project will be obligated when the Project Agreement is executed.

I hereby authorize the initiation of negotiation and execution of the Project Agreement by the officer to whom such authority has been delegated in accordance with A.I.D. regulations and Delegations of Authority subject to the following essential terms and convenants and major conditions; together with such other terms and conditions as A.I.D. may deem appropriate:

a. Source and Origin of Goods and Services

Except for Ocean Shipping , Goods and Services financed by

included in A.I.D. geographic code 935 may be financed under the Grant.

Signature_____
Goler Butcher

_____
AA/AFR

ANNEX M

PROVINCIAL RURAL ROADS COMMITTEES' JUSTIFICATIONS FOR ROADS SELECTED IN GEMU GOFA AND GOJJAM

1. Introduction

The Crown Agents received written reports from elected committees on rural road construction in each of the 14 administrative regions. Below are the committee justifications for some of the roads to be included in the AID-financed project in Gemu Gofa and the full presentation of the Gojjam PRRC.

2. Gemu Gofa (date prepared March 12, 1975)

a. Arba Minch - Felege Neway

1. Approximate distance: 165 km.

2. Names of the districts through which the proposed road passes:

	Name of District	Total Population	No. of Estimated Cattle
a)	Bonke (Gerese)	70,000	70,000
b)	Kemba	65,000	70,000
c)	Zala	32,000	65,000
d)	Gofa	50,000	75,000
	Total	217,000	280,000

3. Kinds of crops, fruits, vegetables as well as domestic and wild animals are the same as it was stated previously.

4. Potential Irrigable Lands:

a) Adowesheba Valley: This valley is located 40 km south of Gerese. A preliminary road was constructed by the Highway Authority for the settlement of Eritreans. The total estimated acreage is about two thousand and the big Weito River flows across this valley.

b) Valley: South of Felege Neway town, an estimated 100 acres of land is located with big river crossing the valley.

5. The impact of the rural roads on the socio-economic status of the population is as it was previously stated.

The reason for constructing rural roads in this region (according to Priority):

a) It connects the four awrajas of the province to the capital Arba Minch.

b) More than half of the estimated population will benefit in trade and other development projects.

c) It facilitates in alleviating the present problem of communication, health, administration, etc.

d) It is highly beneficial in bringing farm products to market areas.

b. Arba Minch - Chencha

(Note the PRRC proposed was for the road to continue beyond Chencha to Dera Malo. The CA included only the first portion for inclusion in the first phase of the Rural Roads Program).

1. Approximate distance: 82 km.

2. Name of districts through which the proposed road passes:

	Name of District	Total Population	No. of Estimated Cattle
a)	Arba Minch	50,000	30,000
b)	Chencha	80,000	30,000
c)	Diia	50,000	45,000
d)	Dera Malo	10,000	15,000
	Total	190,000	120,000

3. Kinds of crops, fruits, vegetables as well as domestic and wild animals are the same as it was stated previously.

4. Potential Irrigable Lands:

Valley of Dera Malo: An estimated irrigable land of more than a thousand acres is located in this valley. In addition there is thermal water.

5. The impact of the rural roads on the socio-economic status of the population is as it was previously stated.

The reason for constructing rural roads in this region (according to Priority):

a) The population of Gemu Awraja is the highest in the Province. It is our opinion that it is essential to improve the existing roads.

b) It is helpful in settling the over-crowded population from the high land to the nearby low land in Dera Malo Valley.

c) This awraja is well known for its weavers (particularly the Dorze Tribes). It will be of great help in selling their products to the nearby towns. It facilitates in bringing tourists to enjoy the evergreen landscapes and magnificent scenery.

c. The other 3 roads selected for inclusion were not included in the Gemu Gofa PRRC report and the justification is addressed in the Economic Analysis Section of the PP.

3. Gojjam (date prepared May 14, 1975)

(Following is complete Gojjam Rural Roads Committee Report).

Ato Teshome Workie
Rural Roads Coordinator
Ethiopian Highway Authority
Addis Ababa

Dear Sir:

It is quite clear that the lack of Rural Roads have hampered the economic and social development as well as the improvement effort in the fields of administration and public security of Gojjam Province.

The Provincial Military Government now wishes to develop, like all the rest of the provinces, and is endeavoring to conduct studies and implement them, Rural Roads being one of them.

As a result of your telephone call to the Province's administrative office in April informing us of the visit of Mr. R.B. Beattie, the Rural Roads Study Team Leader, in connection with the Study, we have tried our

best to extend all help possible. A Rural Roads Committee, comprising 8 Government officials, was formed and a 47-page report (in Amharic) was prepared and handed over to the field team experts.

We hope that the experts, after having studied our report, will come out with a good road construction program to help the Province in its development effort. Attached to this covering letter I am now sending you a copy of the Committee's report.

Ethiopia Tikdem

Zemene Kassa
D/Chief Administrator

cc: Ato Hailu Shawel, EHA G/Manager
Ministry of Interior, Addis Ababa

Mr. R.B. Beattie, Crown Agents
Rural Roads Task Force
Addis Ababa

A. INTRODUCTION

1. Geography and Administration

Gojjam borders Begemdir to the North, Shewa and Welega to the South, Shewa and Welo to the East and Welega and the Sudan to the West.

The area of the province is estimated to be 61,600 sq.kms. The topography consist of both highland and lowland areas. According to the 1964 census the population of the province was 1,750,100. The various tribes of Gojjam are, the Amharas, the Gallas, the Agows, the Shenashas, and the Konfels. All tribes have their own dialects.

There are seven awrajas, thirty four woredas and one hundred and one sub-woredas in this administrative region. The previous administration did not make adequate effort in the field of economic, social and political development in the Province. As a result no road infrastructure exists today except the Addis Ababa-Debre Markos-Gonder route. Therefore, the present Rural Roads Study, commissioned by the Provisional Military Government, is a welcome venture.

2. Rural Roads Committee

Ato Teshome Workie, EHA's Rural Roads Coordinator, telephoned the Deputy Chief Administrator of the Province, in April, informing him that Mr. R.B. Beattie of Crown Agents would visit the Province in connection with the Rural Roads Study. As a result a meeting was organized in which representatives of Government Ministries, officials in the Provincial Administration, the Police and others participated. Consequently a Rural Roads Committee for the province was elected. The members were from:

a. Provincial Administration Office
b. Provincial Police Department
c. Provincial Public Health Department
d. Provincial Education Department
e. Provincial Agricultural Department
f. Provincial EHA District Office
g. Debre Markos Awraja Administration
h. Provincial Commercial Bank

Realizing that the lack of Rural Roads in general has hampered all activities both in the public and private sectors, the committee discussed in detail, the technical know-how, manpower and finances required to construct rural roads in Gojjam.

3. Reports

The Committee, exercising the responsibilities invested in it, asked the various representatives of Government Ministries to prepare reports stating the objectives of their respective departments and how their program of work was affected due to lack of Rural Roads. It also asked all awraja administrators to present the need for rural roads in their districts. With these reports as a start the Committee prepared its own report in the following manner. First, the province's development effort in the fields of agriculture, mining, industry, commerce, education, health, religion, administration and public security was covered. Second, the organizations giving services like telephone, posts and electricity were discussed. Third, the awraja requests for rural roads were given in tabular form and finally the report discusses the benefits of rural roads and recommends the rural roads that should be given priority.

B. DEVELOPMENT SCHEMES

This chapter attempts to explain under the various sub headings the objectives and programs of each activity and how they are affected due to lack of rural roads. It also tries to mention how the economic growth of the Province in coordination with its social progress and public security could help the overall development of the region.

1. Agriculture

Population

This being one of the key factors to overall planning, population figures are given below extracted from the 1970 census.

Population by Awrajas

No.	Awraja	Male	Female	Total
1.	Agew Medir	79,800	77,200	157,000
2.	Bahir Dar	146,000	130,800	276,800
3.	Bichena	95,200	89,400	184,600
4.	Debre Markos	102,000	104,000	206,000
5.	Koladege Damot	154,400	161,000	315,400
6.	Mota	106,600	98,100	204,700
7.*	Metekel	49,578	20,000	69,578
	Total	733,578	680,500	1,414,078

* From EHA News Bulletin, Megabit 67.

2. Agriculture

Land Tenure Reform

The land reform proclamation is now being implemented and thorough explanation being given by Government officials all over the Province. The new land tenure system is expected to help the rapid agricultural development in Gojjam.

Yield: To increase the yield per hectare it was found necessary to use manures or fertilizers and pesticide, although no mechanization in farming is yet introduced in the province.

Yield of Some Cereals and Oil Seeds: Quintals/Hectare

Cereal	Without Manure	With Manure	Crop Pests
Teff	5	8	Army worms
Barley	7	12	Cockroach
Wheat	12	20	Cockroach
Oats	8	10	Cockroach
Maize	15	25	Army worms
Sorghum	15	20	Mites
Dagussa	6	9	Army worms
Oil seed (nug)	6	9	Army worms

It is quite obvious from the above table that those areas served by rural roads could easily get fertilizers and pesticides and therefore produce much more than those without road transport.

Cattle Rearing

There are quite a number of animals in Gojjam that can be used for food and transport as well as others that can attract the tourist industry to develop in the Province. However, not much attention has been given to these matters in the past because there were no rural roads.

No. of Heads of Cattle by Awrajas

No.	Awrajas	Heads of Cattle
1.	Debre Markos	350,000
2.	Bichena	100,000
3.	Mota	150,000
4.	Koladega Damot	500,000
5.	Agew Medir	500,000
6.	Metekel	75,000
7.	Bahir Dar	450,000
	Total	2,125,000

It is our belief that if development officers could travel into the countryside easily and teach modern techniques the number of cattle in the province would increase tremendously.

Other animals available in Gojjam are donkeys, mules, horses, sheep, goats, chickens,fish and camels. The development of these animals is obviously related to rural roads.

Forestry

Forests are useful in that they help to bring the rain, control strong winds, stop erosion. The timber is also used for house building and other related industries.

As agriculture develops in Gojjam, the forests by the riverside and other areas should be preserved and adequate supervision and control be made. Roads are therefore required for the forest officials to carry out the afforestation and other programs. The gradual destruction of forests in the country has now become a national problem and it is necessary that the forest department give advice and education to the people.

Water Resources

In Gojjam there is the world famous Nile River and its many tributaries. These rivers cannot be exploited for use of agriculture mainly because of the lack of roads. Irrigation cannot be taught and demonstrated to the people because officials cannot move within the countryside as they would like.

3. Mining

Although no special study in regard to mining has been conducted in Gojjam, it is evident that there is mining potential even clear to the naked eye.

Gold

The EHA news bulletin of March 1975 explains that in Metekel Awraja the people near Guba, eight years ago and before, used to pay Government taxes in gold. Other precious stones including marble were also seen in the above awraja.

Sand for Construction

Even though sand is abundant in the rivers it cannot be used for construction because of lack of transportation and many schools and other buildings were stopped due to the shortage of this construction material.

The same is true of other soils that can be used for bricks and other construction material.

Iron

Different soils that have iron or similar exploitable substances exist but proper investigations have not been made. Even preliminary studies cannot be done because there are no rural roads.

Mineral Waters

In the lowland areas there are lots of springs that can be used as mineral drinking waters and other uses. Traditionally, people travel by foot with difficulty to these areas for health reasons or considering them to be Holy Water.

4. Industry

Textiles

The only industry in Gojjam is the Bahir Dar Textile Factory. Even though there are cotton growing areas, like Metekel Awraja, in the Province, the factory brings its raw materials from outside the province. This is because the fore-mentioned areas are not developed and there are no roads to these places. The factory's produce is also sold outside the province again because of lack of rural roads.

Food

Gojjam is an agricultural province and produces several grains, cereals and oil seeds. However, much of its surplus cannot be exported or brought to the market because of the acute shortage of roads in the province.

Other

Various trades and cottage industries could develop in Gojjam provided they are stimulated by the construction of rural roads.

5. Commerce

We believe that commerce could develop in given areas if there were transport facilities. Commerce in Gojjam is poor for the time being.

Exports

It is possible to export cereals, oil seeds, honey, skins, cattle and other animals from Gojjam if there are farm-to-market roads. While a quintal of a certain cereal could be sold for $30, the same cereal in the part where there is no road could be sold for $15 only. To hire a donkey costs $50/day. As pack animals are the only mode of transport it costs as much as $400 to buy a donkey.

Imports

Manufactured goods, food and other imported materials cannot reach most of Gojjam. One can observe the differences in living between villages and settlement areas accessible by road. It almost amounts to different civilization.

6. Education

Program

According to the 1970 statistics the following table shows children over 10 years of age in rural areas.

Status	Percent
Pupils	0.17
Literate	0.04
Illiterate	99.79
	100.00%

The high rate of illiteracy shown in the table is due to the Ministry of Education's inability to implement its program in the rural areas. One of the main causes being the lack of rural roads.

Organization

Government Ministries, the Church and other non-Government school organizations are now doing their best to fight illiteracy. The following table shows the various schools in the province.

Number of Schools by Awrajas:

No.	Awraja	Elementary	Junior Secondary	Secondary
1.	Debre Markos	22	2	1
2.	Koladega Damot	27	4	1
3.	Agew Medir	13	2	1
4.	Metekel	14	1	-
5.	Bahir Dar	19	2	1
6.	Bichena	18	1	-
7.	Mota	20	1	-
		133	13	4

In addition to the above table there is a teacher's training school and a polytechnic institute in Bahir Dar town.

The following table shows the total number of schools including those other than Government.

No.	Organization	Number of Schools
1.	Government	152
2.	The Church	13
3.	Private	1
4.	Mission	2
		168

The number of schools shown are not at all adequate, since over 99% of the people in the rural areas are illiterate and we hope the construction of rural roads will help accelerate the education programs.

7. Public Health

Program

The present health facilities in Gojjam are too little to satisfy the need of the two million people, and all are government owned and administered.

Health Facilities by Awrajas:

No.	Awraja	Clinic	Health Center	Hospital	Pharmacies
1.	Debre Markos	6	1	1	5
2.	Koladega Damot	6	1	1	3
3.	Agew Midir	3	1	-	2
4.	Metekel	5	1	-	-
5.	Bahir Dar	4	1	1	6
6.	Mota	4	1	-	1
7.	Bichina	4	1	-	2
		32	7	3	19

The above facilities are more or less located where roads exist. Vaccination programs are always disrupted because of lack of roads. Not much can be done even when emergency contagious diseases occur in non-accessible areas.

8. Religion

Although the majority of the people of Gojjam are Christians there are also a considerable number of Moslems. Both faiths have difficulties in expanding and teaching their respective religions as well as in advising and keeping up the morals of their people in areas where there are no roads. The following tables show the number of religious organizations, churches and mosques present in the province.

No.	Awraja	Monastery	Debir	Rural Churches
1.	Debre Markos	65	30	801
2.	Bahir Dar	87	16	313
3.	Metekel	7	-	100
4.	Agew Midir	19	7	291
5.	Koladega Damot	18	8	221
6.	Bichina	20	18	315
7.	Mota	46	30	244
	Total	262	109	2,285

While monasteries are run by monks, Debir and Rural Churches are run by depteras and high priests respectively.

Number of Mosques by Awrajas:

No.	Awraja	Mosques
1.	Debre Markos	14
2.	Koladega Damot	4
3.	Agew Midir	3
4.	Bahir Dar	7
5.	Mota	4
6.	Bichena	3
7.	Metekel	4
	Total	39

9. Administration and Public Security

If there is efficient administration and peace in an area it is believed that any development effort could easily succeed.

Administration

One of the main tasks of Government officials is to travel in the rural areas with ease so that they can implement their programs in public health, education, agricultural and other services.

An adequate rural road network is required for the administration to fight and control naturally caused disasters, resettlement programs, implementation of the land reform proclamation, formation of farmers cooperatives, etc.

Public Security

It is important that peace should reign in the Province for both efficient administration and development to proceed without disruption. To trail criminals, shiftas, stop and control tribal warfare, etc., it is essential to have rural roads in an area.

C. SERVICES

To achieve better results in all the various development activities mentioned in the previous chapter, service-giving organizations are required. These organizations, in order to give satisfactory services, must themselves be well staffed and expanded.

1. Telecommunications

In order to develop telecommunication in Gojjam we are told that roads must be constructed first.

Present Telephone Services:

a) Exchanges

No.	Awraja	Number
1.	Debre Markos	3
2.	Bichena	3
3.	Mota	1
4.	Koladega Damot	5
5.	Agew Midir	3
6.	Metekel	1
7.	Bahir Dar	3
	Total	19

b) Telephone Distances

No.	Area	Distance in km.
1.	Dejen-Bahir Dar	350
2.	Enjibara-Chagni	56
3.	Dejen-Bichena	36
4.	Bichena-Mota	114
	Total	556

2. Posts

To develop postal services everywhere in Gojjam one condition seems to be the availability of roads.

Post Offices by Awrajas:

No.	Awraja	Permanent	Agent	Postman
1.	Debre Markos	1	5	4
2.	Bahir Dar	1	3	-
3.	Bichena	-	3	2
4.	Mota	-	1	-
5.	Metekel	-	1	-
6.	Koladega Damot	-	5	8
7.	Agew Mider	-	2	-
	Total	2	20	14

3. Electricity

Electric light is available only in Debre Markos and Bahir Dar provided by EELPA. The small generators in Metekel Chagni; Fnoteselam; Dangla; Dejen, Bichena; and in Mota health station were installed by self help schemes. The public effort materialized because there are roads round those areas.

Electric light and power is very much needed in many areas in Gojjam to run mills, oil factories, bakeries, etc. If only roads were constructed, the Government, as well as the public, could develop electricity services, as required.

D. RURAL ROADS STUDY

The following tables show rural roads requirements for each awraja and by order of priorities.

Awraja	Rating	From	To	Dis. in km.
Agew Midir	1	Adis-Kidame	Kakura-Fagita Dangia Fafa	80
	2	Dangla	Chara	20
	3	Dangla	Timhruha	12
	4	Agew G/Bet	Shashema Fafa Azena	60
	5	Injibara	Kasa-Banja	30
				202
Metekel	1	Injibara	Chagni	62
	2	Chagni	Omedla Bambudi	360
	3	Chagni	Wembera Debre Zeyt	170
	4	Chagni	Zigem	42
				634
Debre Markos	1	Debre Markos	Erebu-Gebeya Chikew	55
	2	Yehula	Elias	20
	3	Bulched	Yechibe	16
				91

Awraja	Rating	From	To	Dis. in km.
Mota	1	Mota	Erebu Gebeya	65
	2	Angnedu	Mertolemariam	25
	3	Mota	Adiet	40
	4	Mota	Ashemendegion	20
	5	Keranio	Sedie	
	6	Gundewein	Angue	40
	7	Mota	Fasil Bridge (Begemider Br)	25
	8	Mota	Bichena	115
				330
Bichena	1	Bichena	Key	30
	2	Bichena	Shebel	25
	3	Bichena	Dima	15
	4	Yetmen	Yeduha	25
	5	Shebel	Yeduha	20
	6	Yetmen	Key	25
				140
Koladega Damot	1	Dembecha	Feresbet	70
	2	Jiga	Quarit	65
	3	Telila	Gisheabay	50
	4	Bure	Shendi	23
				208
Bahir Dar	1	Adet	Agta	17
	2	Adet	Wesebet	10
	3	Adet	Gonche Yimache Abay	90
	4	Wetet Abay	Daghi	17
	5	Merawi	Berekt	20
	6	Birawrt	Fannti	10
	7	Abechikeli	Assebe	12
				176

E. RURAL ROAD BENEFITS

Roads are one of the services giving infrastructure as explained in previous chapters. The rural road benefits are given a special chapter because this is the main purpose of the report.

The report prepared by the Rural Roads Committee for Gojjam Province will be given to the Crown Agents/Rural Roads Task Force field team upon arrival. This field team, we understand, is to follow up and work out the details of the work we have commenced.

Existing Roads

While the Dejen-Bahir Dar is the only all weather road the following dry weather roads exist in the Province: (1) Dejen-Mota, (2) Debre Markos-Erob Gebeya, (3) Amanuel-Elias, (4) Injibara-Chagni, (5) Bahir Dar-Blue Nile falls.

Out of the 34 woredas in the Province only 10 have road communication services in the Province. The rest are completely isolated.

Rural Roads Benefits

The report in general attempted to explain that rural roads will help to pave the way to the economic and socio-political development of the Province.

In Metekel Awraja agriculture, the mining and forest potential could well develop if roads are built. The farm-to-market roads could benefit the people, i.e. by using vehicles, more quintal could be transported than by pack animals and the farmers could increase their yield selling their surplus in the market, thereby improving their standard of living. At the same time fertilizers and improved seeds could be transported to them. Therefore, road transport helps both economic and social development.

It has been explained that public security and administration also benefit if roads are available. Unless administrators can travel to perform their duties and responsibilities, development efforts cannot succeed, as shown by the present conditions of most of the awrajas in Gojjam. In these awrajas, public security is threatened and various crimes are committed because concerned officials cannot travel within the districts as required to discharge their duties.

The Rural Roads Committee in this report explained how much Gojjam Province has suffered because of lack of roads and listed out road requirements but has understood that detailed study for each project cannot be made. However, we hope that to help the 2 million people of Gojjam the study team, understanding their problem and condition, will work out a road construction program that can be implemented within a short time.

It has been repeatedly explained in this report that road communication between the awrajas and woredas is very much required. The list of projects sent by the awrajas will serve all ministry representatives and organizations to carry out their programs.

However, the Rural Roads Committee recommends the following road projects in order of priority.

1. Dejen-Bichena-Mota 1/
2. Injibara-Chagni-Omedla-Bambudi 1/
3. Dembecha-Feresbet 3/
4. Jiga-Kuarit 3/
5. Bichena Key 2/
6. Debre Markos-Rebu Gebeya-Mota 3/
7. Addis Kadame-Quakira-Gagta-Dangla-Fata 4/
8. Bahir Dar-Adet-Mota 1/
9. Bulched-Yechibe 3/
10. Chagni-Dibate-Debre Zeyt 3/

There are road construction activities using labor intensive methods in Bahir Dar and Agew Midir Awrajas going on today and it is expected that the order of priorities of these roads will be discussed by the field team experts with the administrators and other Government officials.

1/ ERA road (under construction or proposed)
2/ EPID road (under construction or proposed)
3/ AID-Financed under Rural Roads Project (proposed)
4/ Part EPID, part AID-Financed (under construction or proposed)

ANNEX N

DETAILED IMPLEMENTATION SCHEDULE: DRAFT FOR DISCUSSION

DETAILED IMPLEMENTATION SCHEDULE: DRAFT FOR DISCUSSION

1. MAJOR EVENTS

a. General

Date	Event
7/15/77	1. Project Paper submitted to AID/W.
8/15/77	2. ECPR review by AID/W.
9/01/77	3. Project approved by AID/W.
9/30/77	4. Grant Agreement signed.
10/01/77	5. RFP for Technical Assistance completed by RRO/USAID with REDSO assistance.
11/01/77	6. RFP for Technical Assistance advertised in CBD .
12/01/77	7. IFP for equipment completed by ERA and approved.
1/01/78	8. IFB for equipment advirtised in CBD.
1/15/78	9. Proposals for Technical Assistance opened.
2/15/78	10. Proposals for Technical Assistance analysed and approved.
3/15/78	11. Award of Technical Assistance contract.
4/01/78	12. Bids for equipment IFB opened.
5/01/78	13. Arrival of Technical Assistance Team Leader.
5/15/78	14. Bid Analysis for equipment completed and approved.
6/01/78	15. Award of equipment contract.
8/01/78	16. Arrival of equipment Specialist, Training Specialist and Procurement & Supply Specialist.

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Date	Event
9/01/78	17. Arrival of Technical Reports, Construction Supervisor Trainer and Accountant Trainer.
2/01/79	18. Delivery of equipment to Ethiopia.
6/01/79	19. Departure of Technical Reports Enginner.
9/01/79	20. Departure of Accounts Specialist.
12/01/79	21. Departure of Construction Supervisor Trainer.
7/01/81	22. Departure of Team Leader, Equipment Specialist, Procurement and Supply and Training Specialist.
7/31/81	23. End of Project.

b. Gemu Gofa Province

1) Provincial Headquarters

Date	Event
6/01/77	1. Construction work started on Gemu Gofa Headquarters and work shop.
3/31/78	2. Headquarters and workshop buildings and work areas completed.
6/01/78	3. Procurement of workshop tools and small equipment completed.
7/01/78	4. Provincial Headquarter workshop begins limited operation.
3/15/79	5. Major equipment for workshop arrives.

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Date	Event
5/01/79	6. Province workshop becomes fully operational.
6/01/79	7. Self-help unit begins operation.
10/01/79	8. Provincial Headquarters becomes fully operational.

2) CONSTRUCTION UNIT

a) Arba Minch/Gidole Rd - Felege Neway -167 Kms

Date	Event
1/01/78	1. Start mobilization of labor, materials and equipment for construction camp at station 5 +000 for Arba Minch/Gidole Rd- Gerese section.
4/01/78	2. Construction Camp completed.
4/15/78	3. Mobilization of labor, materials and equipment completed for labor intensive road construction and work begins.
3/15/79	4. Completion of 20 Kms. of labor intensive road construction
3/15/79	5. New construction equipment arrives on project.
6/01/79	6. Start mobilization for construction camp for Gerese - Kamba section at station 40+000 .
7/15/79	7. Completion of construction for Arba Minch/ Gidole Rd - Gerese.
7/15/79	8. Completion of construction camp for Gerese-Kamba section.

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Date	Event
8/01/79	9. Construction work started on Gerese - Kamba section.
11/01/79	10. Start mobilization for construction camp for Kamba - Jinka Rd. Junction section at station 100+000
1/01/80	11. Completion of construction of Gerese - Kamba section.
1/15/80	12. Completion of construction camp for Kamba - Jinka Rd. Junction section
1/15/80	13. Construction work started on Kamba - Jinka Rd. Junction section.
7/01/80	14. Start mobilization for construction camp for Jinka Rd. Junction - Felege Neway section at station 160+000.
9/01/80	15. Construction work completed on Kamba - Jinka Rd. Junction section.
9/01/80	16. Construction camp on Jinka Rd. Junction - Felege Neway section.
9/15/80	17. Construction work started on Jinka Rd. Junction - Felege Neway section.
7/31/81	18. Completed construction work on Jinka Rd. Junction - Felege Neway section.

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b) Arba Minch/Sodo Rd. - Chencha - 25 Kms.

Date	Events
1/01/79	1. Start mobilization of labor, materials and equipment for construction and camp.
3/15/79	2. New construction equipment arrives on the project.
4/01/79	3. Construction camp completed and road construction work started.
9/01/79	4. Completed construction work on section.

c) Arba Minch/Konso Rd. - Sidamo Border - 50 Kms.

4/01/78	1. Start mobilization of labor, materials and equipment for construction and camp.
6/01/78	2. Construction camp completed.
6/15/78	3. Construction work started on road.
3/15/79	4. Completed 16 Kms. by labor intensive methods.
3/15/79	5. Construction work started with new construction equipment arriving on project.
4/15/79	6. Start mobilization of second construction camp at station 25+000.
6/15/79	7. Completion of 25 Kms. of road.
7/01/79	8. Second construction camp completed and work begin on second 25 Kms.

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Date	Event
12/01/79	9. Completion of road section.
	d) Turmi - Murle 60 Kms.
1/01/80	1. Start mobilization of labor materials and equipment for first camp at station 0+000 and construction.
4/01/80	2. Completion of construction camp and begin construction.
6/01/80	3. Start mobilization for second camp at station 30+000.
8/01/80	4. Complete first 30 Kms. of road.
8/15/80	5. Complete section camp and start construction on second 30 Kms.
1/01/81	6. Completion of construction on section.
	e) Jinka - Mago Park H.Q. - 34 Kms.
2/01/81	1. Start mobilization of labor, materials and equipment for camp and construction
4/01/81	2. Completion of camp and begin construction of road.
9/31/81	3. Completion of construction section and end of project.

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3) MAINTENANCE UNIT

Date	Event
3/15/79	1. New maintenance equipment arrives at the Province Headquarters.
4/01/79	2. Maintenance Crews organized to begin maintenance on Arba Minch - Konso - Jinka Rd.
7/15/79	3. Maintenance Crew assumes maintenance of Arba Minch/ Gidole Rd. - Gerese section.
9/01/79	4. Maintenance Crew assumes maintenance of Arba Minch/ Sodo Rd. - Chencha section.
12/01/79	5. Maintenance Crew assumes maintenance of Arba Minch/Konso Rd. Sidamo Border section.
1/01/80	6. Maintenance Crew assumes maintenance of Gerese - Kamba section.
9/01/80	7. Maintenance Crew assumes maintenance of Kamba Jinka Rd. Junction section.
1/01/81	8. Maintenance Crew assumes maintenance of Turmi - Murle section.
7/31/81	9. Maintenance Crew assumes maintenance of Jinka Rd. Junction - Felege Neway Jinka - Mago Park H.Q. sections and end of project.

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c) Gojam Province

1) Provincial Headquarters

Date	Event
9/01/78	1. Construction work started on Gojam Headquarters and workshop.
3/01/79	2. Headquarters and workshop buildings and work area completed.
3/15/79	3. Major equipment and tools arrive in workshop.
5/01/79	4. Province workshop becomes fully operational.
6/01/79	5. Self-help unit begins operation.
10/01/79	6. Province Headquarters becomes fully operational.

2) Construction Unit

a) Wetel Abay - Daghi - 17 Kms.

1/01/78	1. Start mobilization of labor, materials and equipment for camp and construction of road.
4/01/78	2. Construction camp completed and work on road started.
4/15/79	3. New construction equipment arrives on project and completion of 16 Kms. of road by labor intensive methods.
5/15/79	4. Completion of road section.

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b) Debra Markos - Erob Gebeya - 40 Kms.

Date	Event
1/01/78	1. Start mobilization of labor, materials and equipment for camp and construction of road.
4/01/78	2. Construction camp completed and work on road started.
3/15/79	3. New construction equipment arrives on project and completion of 16 Kms. of road by labor intensive methods.
10/15/79	4. Completion of road section.

c) Minase Kola - Berekt - 25 Kms.

3/01/79	1. Start mobilization of labor, materials and equipment for camp and construction of road.
6/01/79	2. Construction camp completed and work on road started.
1/01/80	3. Completion of road section.

d) Erob Gebeya - Mota - 65 Kms.

9/01/79	1. Start mobilization of labor, materials and equipment for camp and construction of road.
11/01/79	2. Construction camp completed and work on road started.
5/01/80	3. Start mobilization of labor, materials and equipment for second camp and construction of road.

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Date	Event
7/01/80	4. Complete first 30 Kms. and begin construction on second 35 Kms.
3/01/81	5. Completion of road section.
	e) Bichena - Shebel - 25 Kms.
12/01/79	1. Start mobilization of labor,materials and equipment for camp and construction of roads.
2/01/80	2. Construction camp completed and work on road started.
8/01/80	3. Completion of road section.
	f) Bulched - Yejube - 35 Kms.
12/01/80	1. Start mobilization of labor, materials and equipment for camp and construction of road.
2/01/81	2. Construction camp completed and work on road started.
5/01/81	3. Completion of road section.
	g) Fegita - Dongie/Fafa - 25 Kms.
3/15/81	1. Start mobilization of labor, materials and equipment for camp and construction of road.
5/15/81	2. Construction camp completed and work on road started.
7/31/81	3. Completion of road section and project.

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h) Mota/Bichena Rd. - Mertole Mariam - 25 Kms.

Date	Event
7/01/80	1. Start mobilization of labor, materials and equipment for camp and construction of roads.
9/01/80	2. Construction camp completed and work on road started.
1/01/81	3. Completion of road section.

i) Chazni - Debate - Debre Zyet - 33 Kms.

1/01/81	1. Start mobilization of labor, materials and equipment for camp and construction of roads.
4/01/81	2. Construction of camp completed and work on road started.
7/31/81	3. Completion of road section and project.

3) MAINTENANCE UNIT

3/15/79	1. New maintenance equipment arrives at the Province Headquarters.
4/01/79	2. Maintenance Crew organized to begin maintenance on existing rural roads.
5/15/79	3. Maintenance Crew organized to begin maintenance on Bahre Dar - Mota Rd.

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Date	Event
5/15/79	4. Maintenance Crew assumes maintenance of Watel Abay - Daghi section.
10/15/79	5. Maintenance Crew assumes maintenance of Debra Markos - Erob Gebeya section.
1/01/80	6. Maintenance Crew assumes maintenance of Minase Kola - Berekt section.
8/01/80	7. Maintenance Crew assumes maintenance of Bichena - Shebel section.
1/01/81	8. Maintenance Crew assumes maintenance of Mota/Bechena Rd. - Mertole Mariam section.
5/01/81	9. Maintenance Crew assumes maintenance of Bulched - Yijube section.
7/31/81	10. Maintenance Crew assumes maintenance of Fegita - Dangie/Fafa section.
7/31/81	11. Maintenance Crew assumes maintenance of Chazni-Debate - Debre Zyet section on project.

ANNEX O

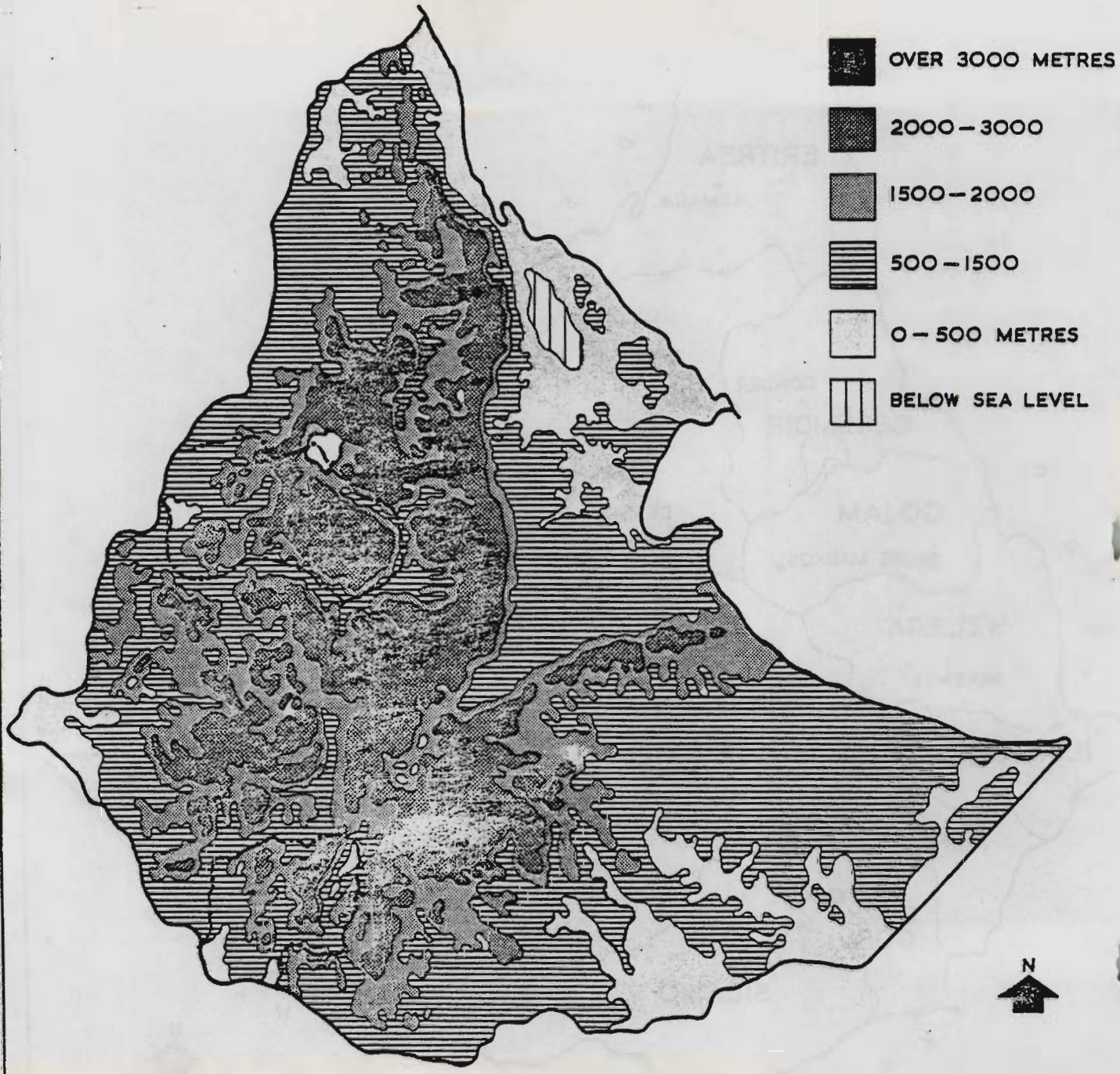
MAPS

INTERNATIONAL BOUNDARY

PROVINCIAL BOUNDARY

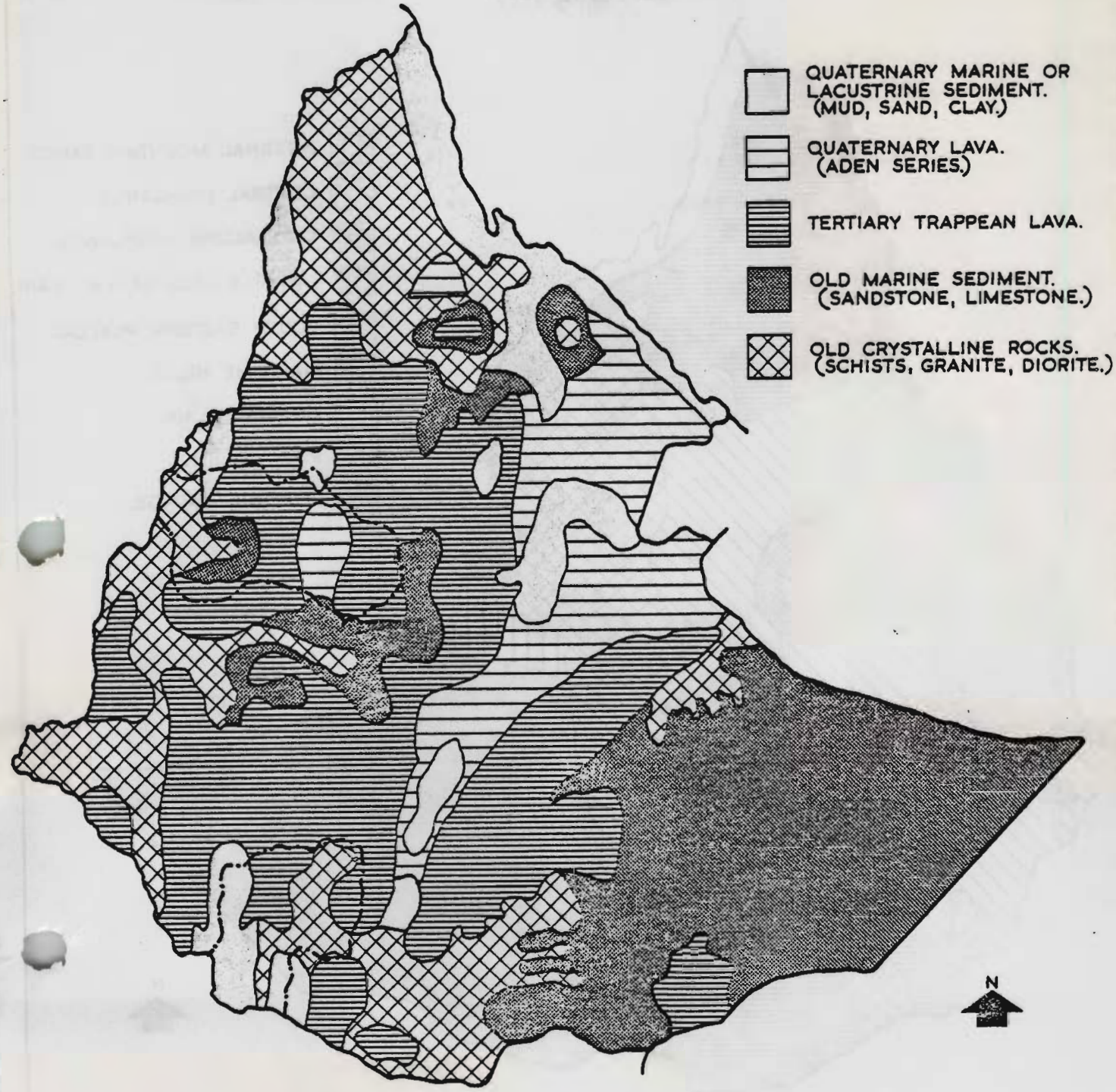
ETHIOPIA

ADMINISTRATIVE REGIONS



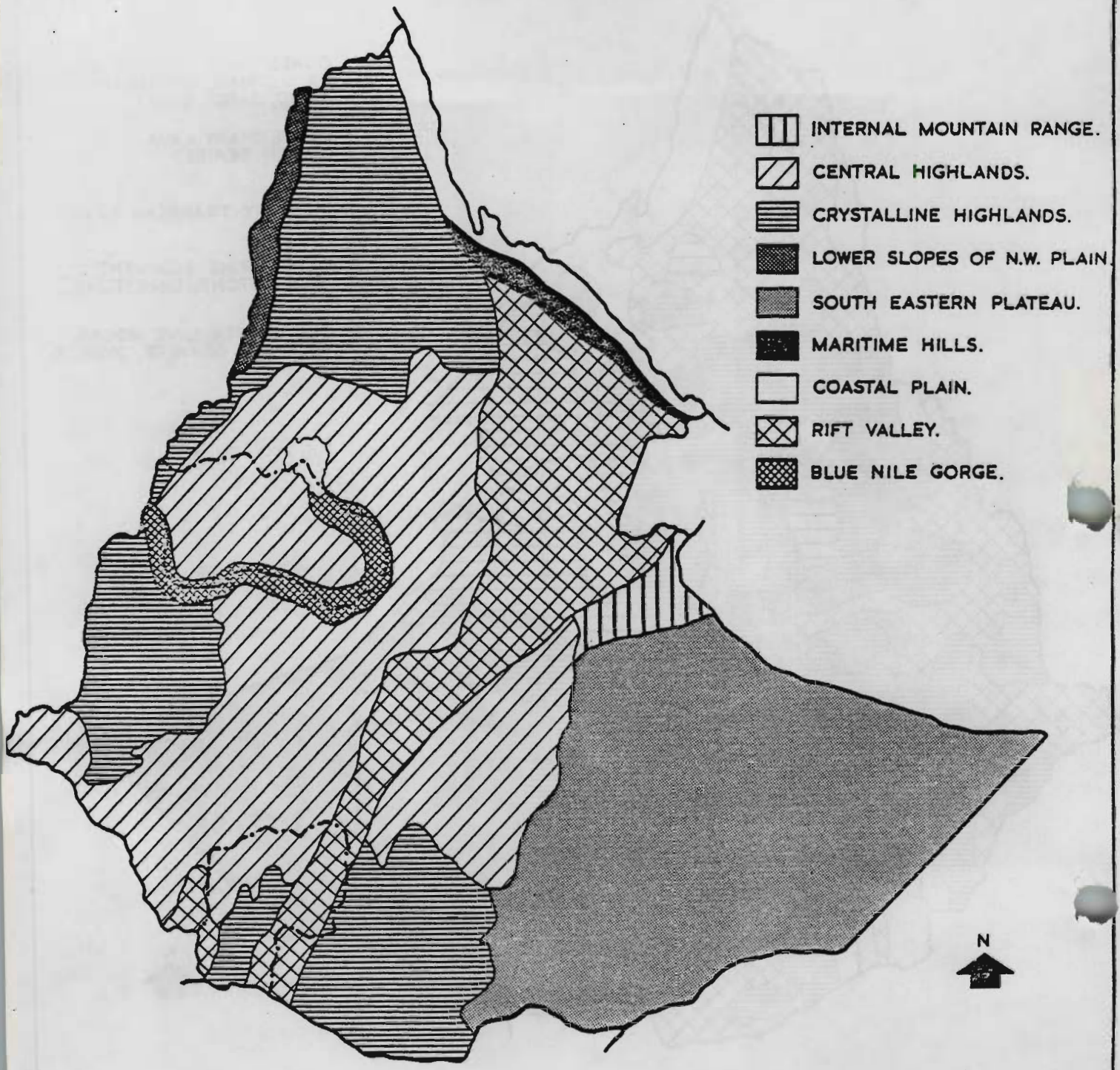
ETHIOPIA

RELIEF



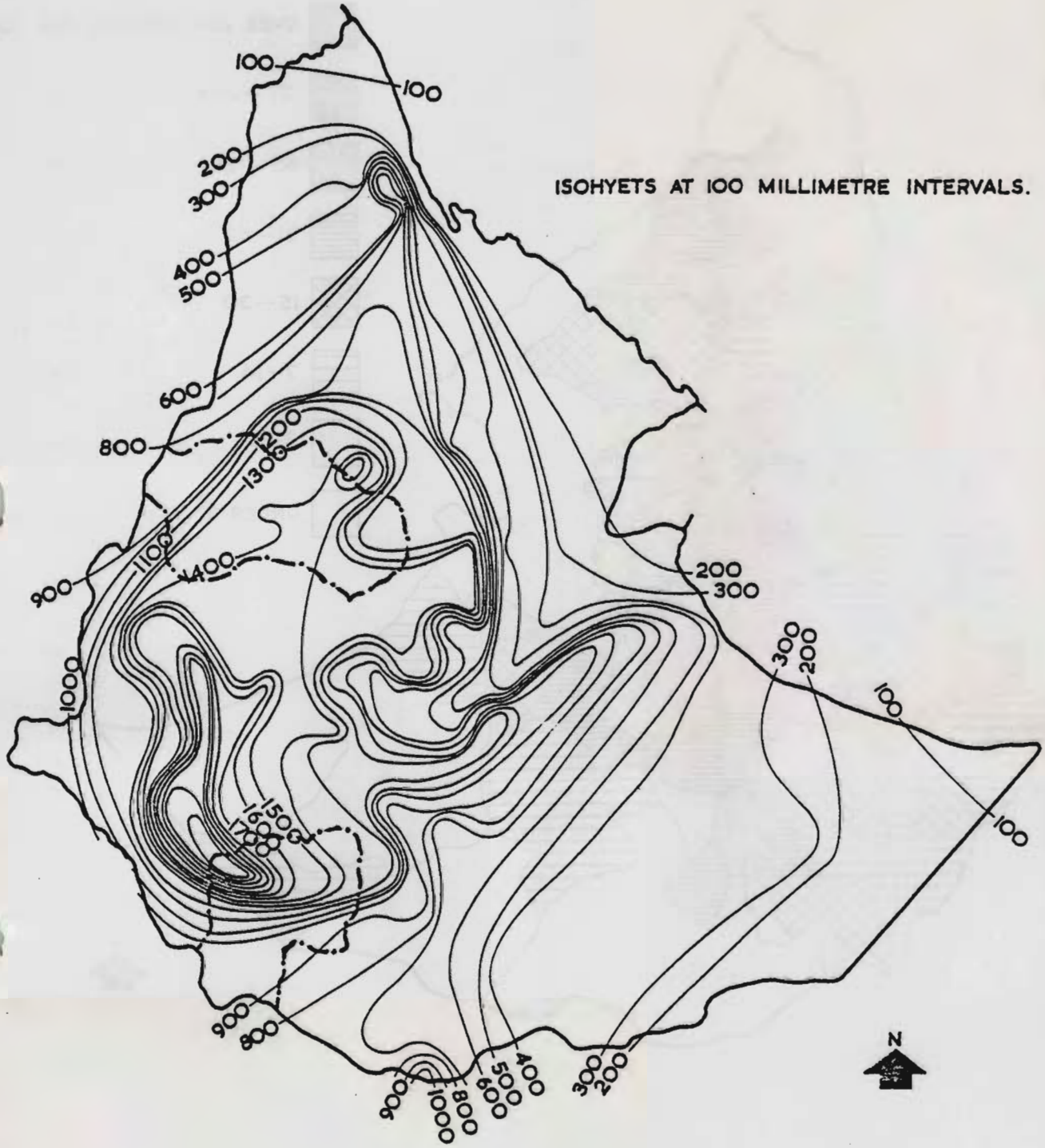
ETHIOPIA

GEOLOGY



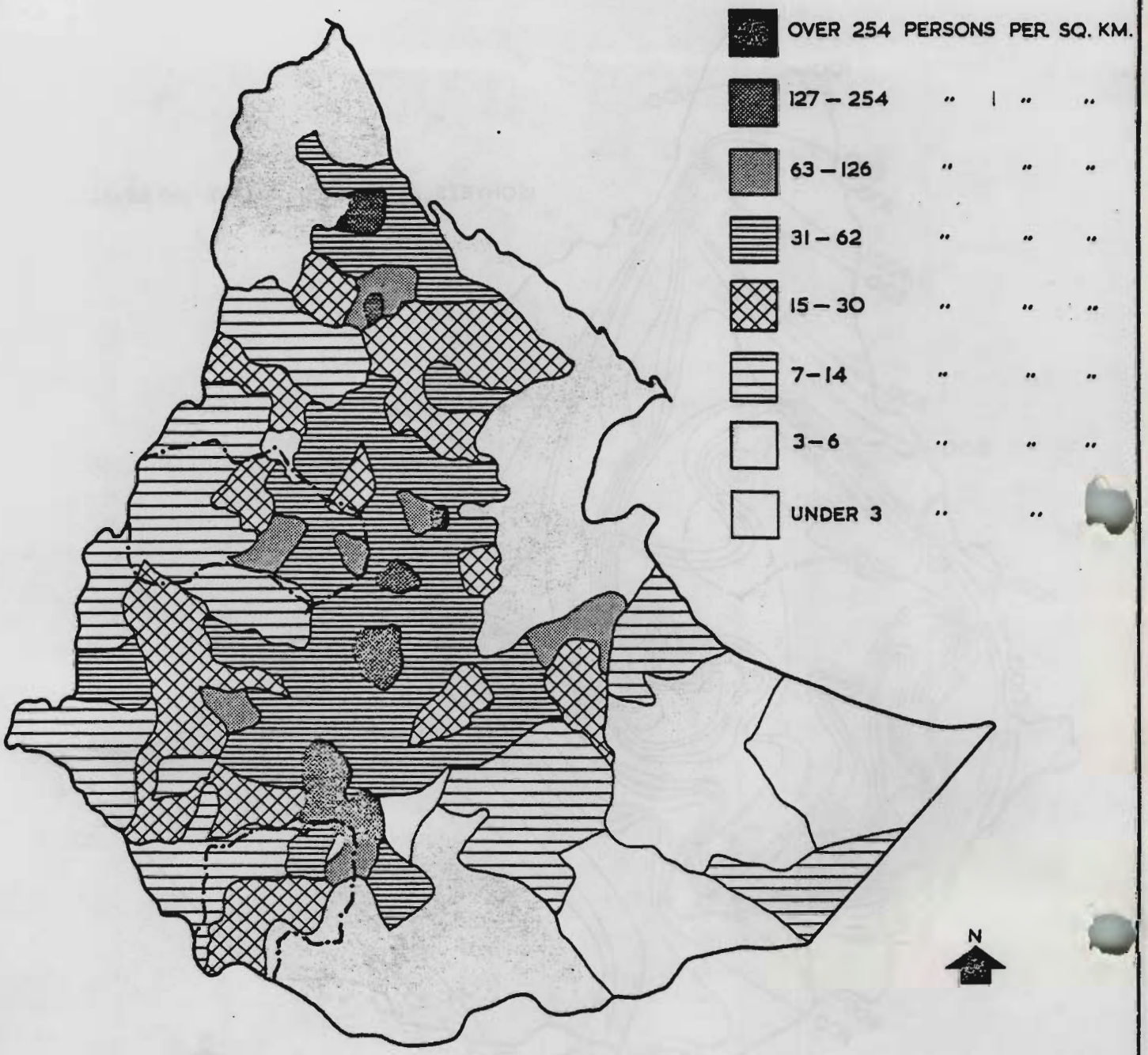
ETHIOPIA

PHYSIOGRAPHIC REGIONS



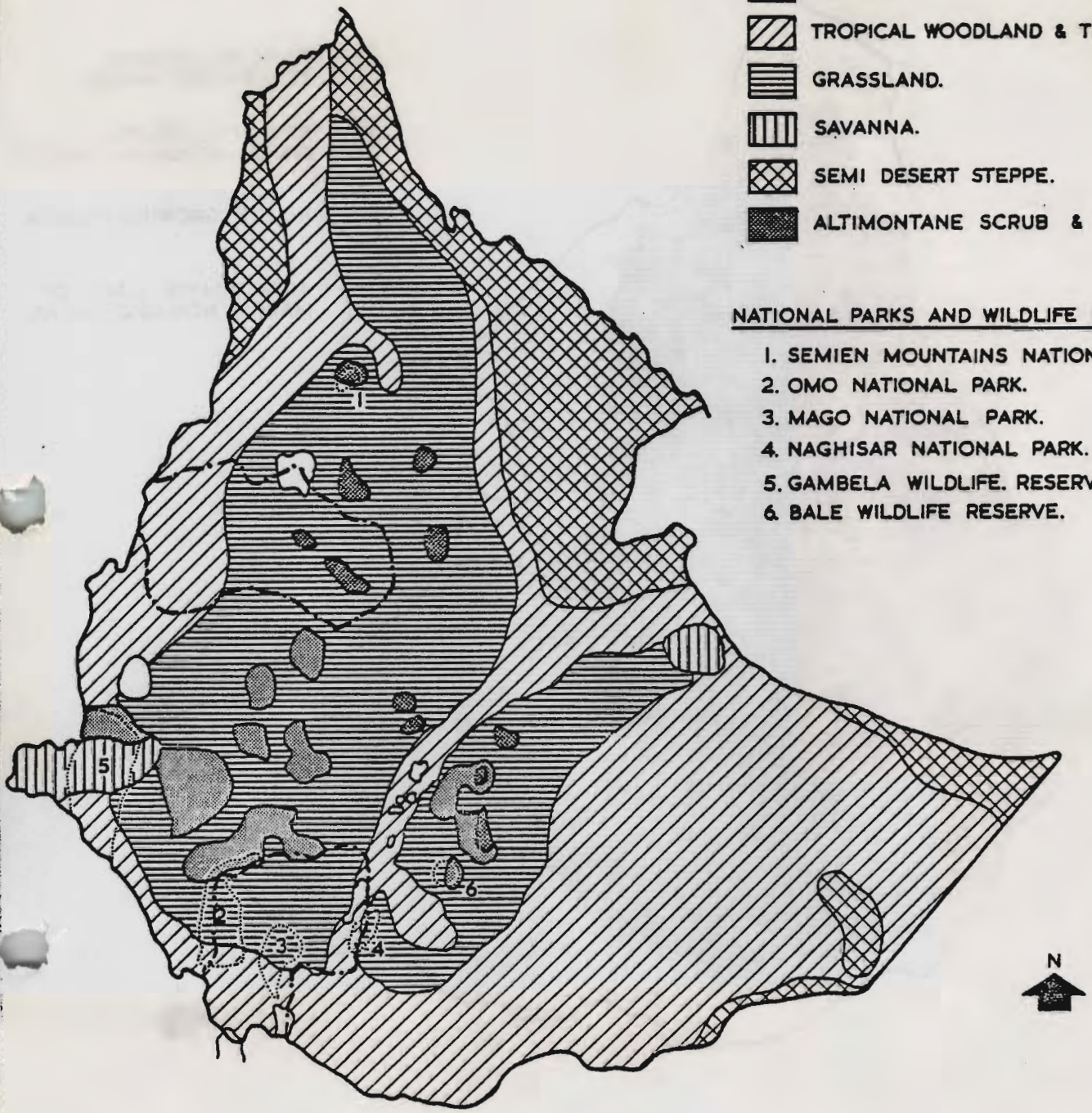
ETHIOPIA

AVERAGE
ANNUAL RAINFALL



ETHIOPIA

DENSITY OF POPULATION



SWAMP.

FOREST.

TROPICAL WOODLAND & THORNBUSH

GRASSLAND.

SAVANNA.

SEMI DESERT STEPPE.

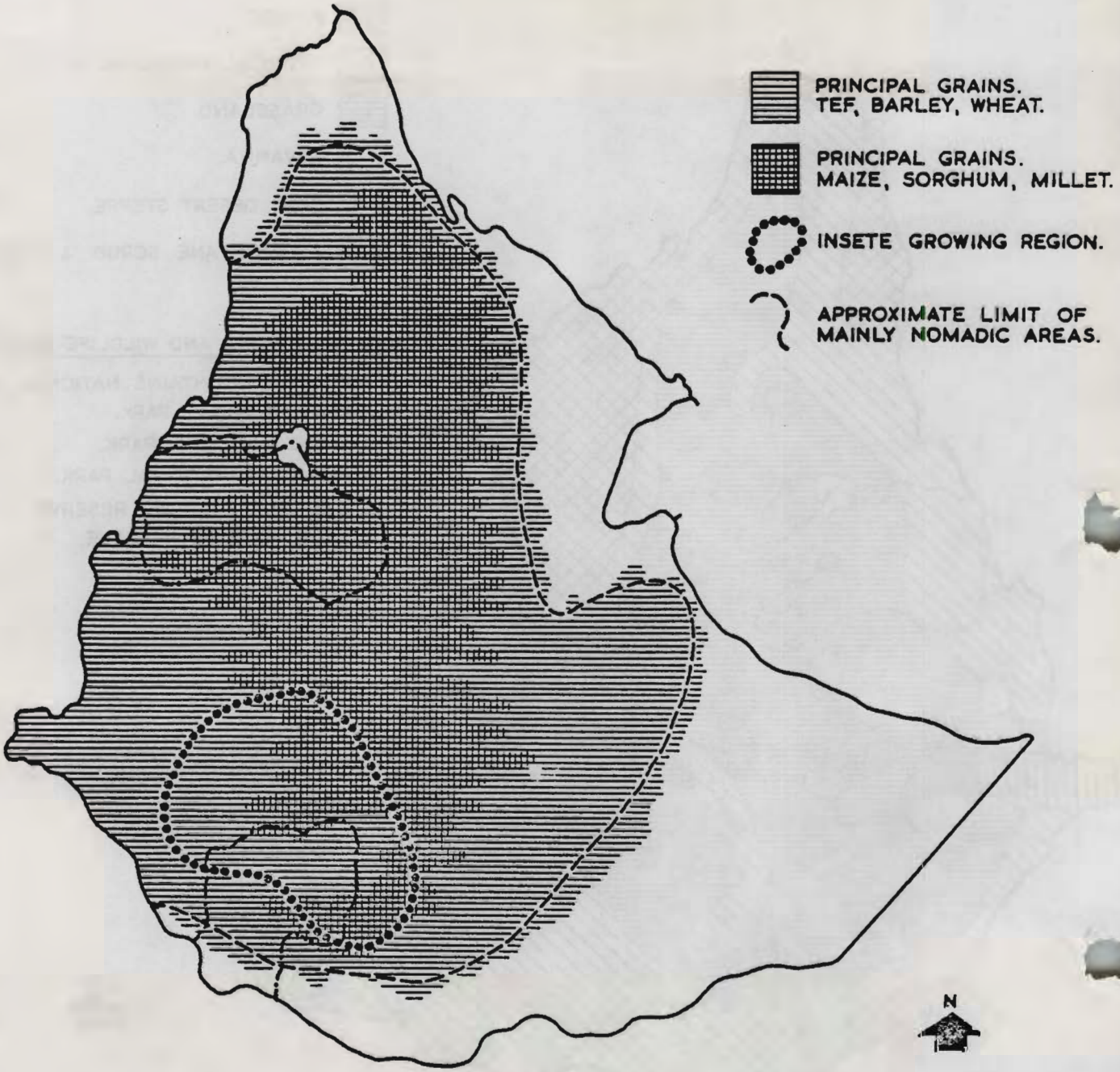
ALTIMONTANE SCRUB & STEPPE.

NATIONAL PARKS AND WILDLIFE RESERVES.

1. SEMIEN MOUNTAINS NATIONAL PARK.
2. OMO NATIONAL PARK.
3. MAGO NATIONAL PARK.
4. NAGHISAR NATIONAL PARK.
5. GAMBELA WILDLIFE. RESERVE.
6. BALE WILDLIFE RESERVE.

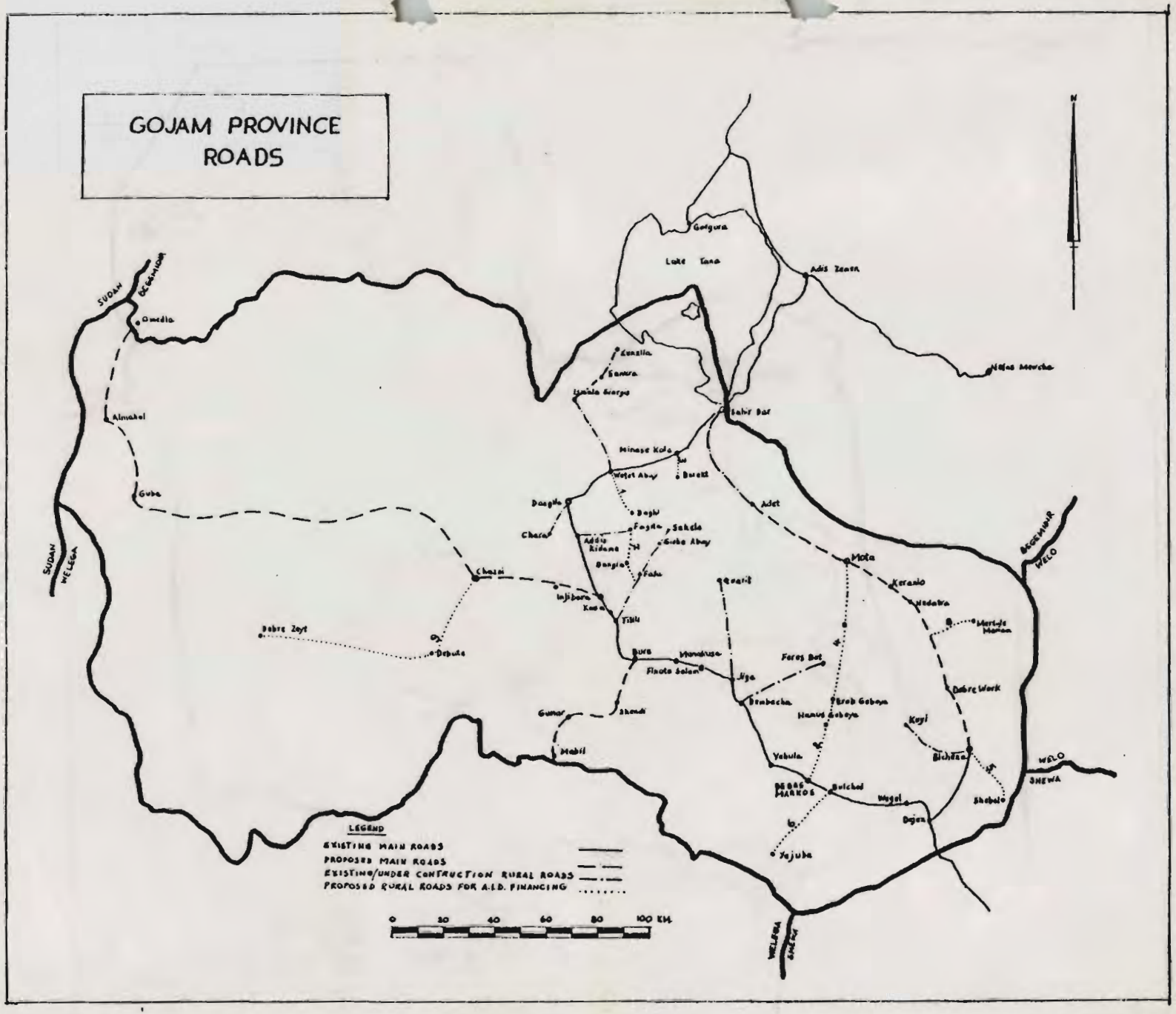
ETHIOPIA

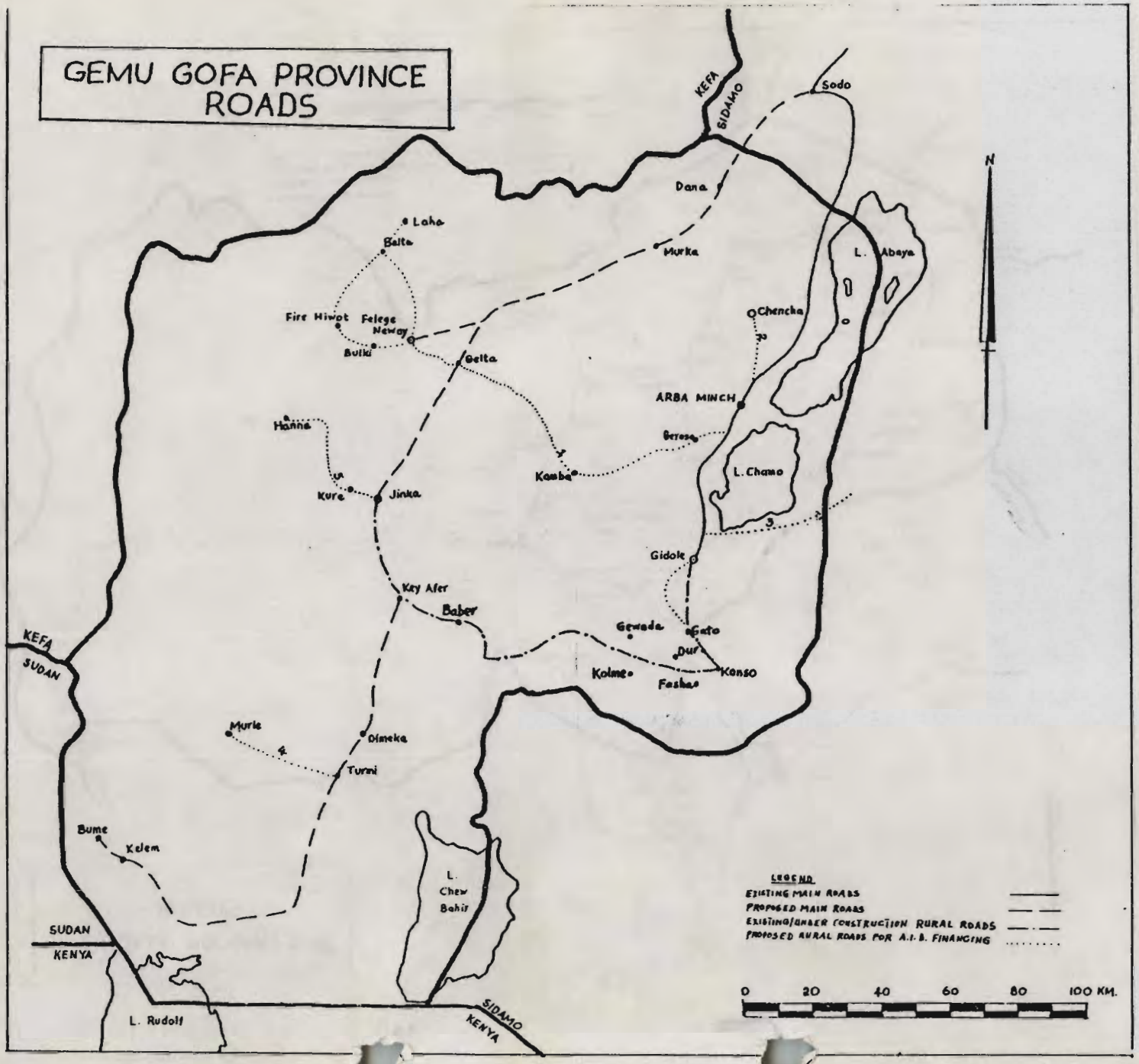
VEGETATION



ETHIOPIA

FOOD PRODUCTION


GOJAM PROVINCE
ROADS
N
SUDAN
ETHIOPIA
Omedla
Almakal
Guba
SUDAN
WELEGA
Lake Tana
Gorgura
Adis Zemen
Kunzila
Samara
Bahir Dar
Minase Kola
Wotet Abay
Burekt
Adet
Dangila
Chara
Addis Kidane
Sakela
Giche Abay
Mota
Chesni
Injibara
Kuara
Tilili
Debre Zeyt
Debuka
Kerania
Hedatu
Mertule Maryam
Fareg Bet
Finote Selam
Jiga
Debre Work
Gunar
Shendi
Mabil
Kayi
Yabula
Bichena
DEBRE MARKOS
Bulchel
Wegel
Shebelo
Dejen
Yajuba
WELO
SHEWA
LEGEND
EXISTING MAIN ROADS
PROPOSED MAIN ROADS
EXISTING/UNDER CONTRUCTION RURAL ROADS
PROPOSED RURAL ROADS FOR A.I.D. FINANCING
0 20 40 60 80 100 KM.


GEMU GOFA PROVINCE
ROADS
KEFA
SIDAMO
Sodo
Dana
Murka
Laha
Belta
Fire Hiwot
Felege Neway
Bulki
Gelta
Chencha
L. Abaya
ARBA MINCH
Hanna
Berese
Kamba
L. Chamo
Kure
Jinka
Gidole
Key Afer
Baber
Gewada
Gato
Dur
Konso
Kolme
Fasha
KEFA
SUDAN
Murle
Dimeka
Turmi
Bume
Kelem
L. Chew Bahir
SUDAN
KENYA
L. Rudolf
SIDAMO
KENYA
N
LEGEND
EXISTING MAIN ROADS
PROPOSED MAIN ROADS
EXISTING/UNDER CONSTRUCTION RURAL ROADS
PROPOSED RURAL ROADS FOR A.I.B. FINANCING
0 20 40 60 80 100 KM.