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ABBREVIATIONS USED

ADT	Average Daily Traffic
AVA	Awash Valley Authority
CAA	Civil Aviation Administration
CFNIS	Consolidated Food and Nutrition Information Service
CADU	Chilalo Agricultural Development Unit
CSO	Central Statistics Office
DAA	Drought Area Assessment
EDP	Electronic Data Processing
ENI	Ethiopian Nutrition Institute
EPID	Extension Project Implementation Division
EPMG	Ethiopian Provisional Military Government
ERA	Ethiopian Road Authority
EWS/DAA	Early Warning System/Drought Area Assessment
FAO	Food and Agriculture Organization, United Nations
FAR	Fixed Amount Reimbursal (procedure)
GOE	Government of Ethiopia
HERF	Highway Equipment Repair Facility
IBRD	International Bank for Reconstruction and Development (World Bank)
IFB	Invitation for Bid
ILCA	International Livestock Center for Africa
LMB	Livestock and Meat Board
MES	Malaria Eradication Services
MCNP	Ministry of Community and National Development
MCA	Ministry of Agriculture
MOE	Ministry of Education
MOPH	Ministry of Public Health

MHS	Nutrition/Health Early Warning System
ODM	Overseas Development Ministry (UK)
PCO	Planning Commission
PPD	Planning & Programming Department, Ministry of Agriculture
PIG	Project Implementation Group
PMAC	Provisional Military Administrative Council
R/R	Recovery and Rehabilitation (program)
RRC	Relief and Rehabilitation Commission, Government of Ethiopia
RRD	Rural Roads Division of Ethiopian Roads Authority
SIDA	Swedish International Development Association
TWG	Technical Working Group
TIS	Technical Information Service
UNICEF	United Nations International Children's Emergency Fund
UK	United Kingdom
WADU	Wollamo Agricultural Development Unit
WHO	World Health Organization
WMO	World Meteorological Organization

I. Summary and Recommendations

A. Face Sheet Data - See above

B. Recommendations

Activities Proposed for Financing:

<u>Activity</u>	<u>Amount to be Financed (\$000)</u>
a) Nutrition/Health Early Warning System - Drought Area Assessment	\$ 1,000
b) Southern Gemu Gofa Drought Areas Rural Access Roads	<u>4,000</u>
Total new AID Grant Obligation	\$ 5,000

C. Description of the Project

This project will finance with U.S. grant funds local costs for two discrete activities designed to strengthen the capacity of the Government of Ethiopia (GOE) to detect and respond to drought and other natural disasters and preclude the recurrence of famine, human suffering and death. As such, the project is a logical continuation of special drought assistance provided by the USG in FY 75 under Grant 663-F-601. The two activities are:

1. Nutrition/Health Early Warning System - Drought Area Assessment

US\$ 1 million of the grant will be utilized for local currency costs of recurrent expenditures and off-shelf procurement of limited support equipment over a 30-month period to provide operational support for a Coordinating Secretariat, Statistical and Data Processing Unit and the initial field assessment of Market and Pastoral conditions required for the establishment and conduct of a national Nutrition/Health Early Warning System and an augmented Drought Area Assessment Program (EWS/DAA).

In addition to the USG grant financed components of this activity, specific funds will be provided by the IBRD for Crop Assessment; by Sweden (SIDA) for support of the Drought Area Assessment sub-activity, Nutrition Assessment and Climate Assessment. UNICEF is additionally financing specific portions of both the Nutrition and Climate Assessment elements of the program with SIDA.

The activity provides for the training of 1,700 field agents, approximately 500 of whom will be added to the existing staff of the participating government institutions under the IBRD financed portion;

the addition of expert staff to the existing Secretariat of the RRC Technical Information Service (TIS) and the Central Statistics Office (CSO); the procurement of office support equipment for these offices and the provision of required field support and reporting equipment including additional meteorological instruments; radios; minor construction materials and personal requirements items.

The EWS/DAA will be implemented by the Relief and Rehabilitation Commission (RRC) and aims at establishing and improving environmental and human condition assessment and reporting being, and to be, performed by existing GOE institutions to include the Ministry of Public Health (MPOH), Civil Aviation Administration (CAA), Livestock and Meat Board (LMB), Ministry of Agriculture (MOA), Ethiopian Nutrition Institute (ENI), and Central Statistics Office (CSO), and provides a permanent mechanism within the GOE for ongoing collation, analysis and evaluation of such reporting to provide the capacity of the GOE to effectively prepare and respond to future potential disasters.

2. Southern Gemu Gofa Drought Area Access Roads

US\$ 4 million of the grant will provide foreign exchange for the procurement of equipment in the amount of \$ 2.1 million and local cost financing in the amount of \$ 1.9 million for the construction, over a 60 month period, of approximately 230 kilometers of high priority rural access road in Southern Gemu Gofa province for the purpose of permitting all-weather ground transport to and within one of Ethiopia's most seriously affected, isolated regions, where emergency relief is now being air-dropped on a continuing basis.

U.S. funds, which will be disbursed utilizing a modified Fixed Amount Reimbursable (FAR) basis, will finance a portion of local currency expenditures for force account construction of the road described by the Rural Roads Division (RRD) of the Ethiopian Roads Authority (ERA) which will implement the activity under the coordination of the RRC.

The proposed road activity will be constructed to Ethiopian Government Class "B" standards utilizing a mix of labor and equipment intensive methods. This road, which will permit all weather* use, will begin at the termination point of the present penetration road now being constructed under Activity E-2 of Grant 663-F-601, Jinka, and conclude at Kelem.

The entire road system proposed under this activity represents presently planned pre-condition requirements in support of a comprehensive Southern Gemu Gofa Development Program designed to address, on an integrated basis, the fundamental problems of the area.

* All weather use in this sub-project means at least 75% annual accessibility.

3. Implementation

This project is a continuation of discrete Recovery and Rehabilitation grant activities (663-F-601) undertaken in FY 75 as the result of Congressional action pursuant to Section 639 (a) (b), FAA of 1963, as amended, authorizing specific funds for the purpose of addressing, on an accelerated basis, critical problems affecting those countries in Africa stricken by prolonged drought.

The project is intended to assist the Ethiopian Government in further expanding measures already planned and designed for the most rapid implementation possible and for which a minimum of non-financial external resources - commodities, technical assistance or administrative manpower - are required and which are within the present management capacity of the Government of Ethiopia to implement.

Because of the precedental nature and effectiveness of the initial recovery and rehabilitation program support, the Mission is proposing that to the extent possible and commensurate with current Congressional requirements, the character of the initial support provided under Grant 663-F-601 be retained.

Specifically, it is proposed that:

a) the overall concept of host country management of the project, based on Mission concurrence with the suitability and soundness of the Government's management procedures and implementing agencies as described herein, be continued under this project.

b) the use of the form and substance of the Grant Project Agreement, obligation mechanism and implementation/accountability procedures obtaining under Grant 663-F-601 as detailed herein be continued.

D. Summary Findings

On the basis of the analysis herein, the USAID Mission to Ethiopia concludes that the project is technically, economically and financially sound, and recommends that a grant be authorized to the GOE in an amount not to exceed \$ 5.0 million.

The project meets all applicable statutory criteria (see Annex XVIII). The USAID Mission Director in Ethiopia has certified that Ethiopia has the capability to effectively maintain and utilize the project (Annex IV).

E. Issues

Disbursement period of sub-project B, Southern Gemu Gofa Drought Area Road, is projected to be 60 months. See Section B, Part IV, B, Implementation Plan/Disbursements.

F. Conditions, Covenants and Negotiating Status

The Grant Agreement for the project will be similar to that used for Grant Agreement No. 663-F-001 to benefit from the RRC familiarity with the type of documentation utilized thereunder and to facilitate implementation. Two standard conditions precedent to initial disbursement will be included. One will require a legal opinion from the GOE Attorney General or other counsel satisfactory to AID that the agreement is legally valid and binding. The other will require the GOE to designate its authorized representatives and to provide their specimen signatures.

Similar to Grant Agreement No. 663-F-001, the execution of Activity Implementation Agreements applicable to Project Sections (or Parts) A and B will be conditions precedent to disbursement for the respective Sections. Certain detail applicable to the particular Project Sections may then be included in the individual Activity Implementation Agreements where appropriate, and all GOE agencies with implementation responsibilities will sign the applicable Activity Implementation Agreement.

In regard to Project Section B, the GOE has indicated its willingness and has made plans to provide a Bailey bridge over the Waite River to improve accessibility to the job site and a ferry with ten ton capacity for the Omo River at the end of the road. The Agreements will contain appropriate conditions precedent to disbursement or covenants to assure that an adequate bridge and ferry, acceptable to AID, are in operation at the times required in the implementation schedule. Under the agreement, AID will be permitted to suspend disbursement if an adequate bridge or ferry is not operational in a timely manner.

The nature, description and means of implementing all elements of the Project have been considered in detail and concurred in by all GOE agencies involved in implementation. There appears to be no disagreement concerning implementation details and the respective obligations of the parties. The form and relevant general content of the agreements have been reviewed and concurred in by the respective GOE implementing agencies.

G. Project Background

Introduction: With this project, the Mission is proposing specific medium term grant assistance in the amount of \$5,000,000 to further expand the measures being undertaken by the Government of Ethiopia to assure the return to productive life of those who have been touched by drought and to preclude recurrence of a future disaster emergency and consequent loss of human and animal life. This assistance

will continue the focus of the initial Ethiopia Recovery and Rehabilitation Program (see: Ethiopia Recovery and Rehabilitation Program, 603-F-601) funded in the amount of \$8,000,000 from special Congressional Africa drought assistance for Ethiopia in FY 75 and will concentrate on discrete and immediate problems constraining the lives of the people in southern and eastern Ethiopia.

Specifically, as already noted, this project will comprise USG support in the amount of \$ 4.0 million for the expansion of urgently required penetration roads in southern Gemu Gofa province in support of regional rural development plans and assistance in the amount of \$ 1.0 million for the establishment and operation of a Nutrition/Health Early Warning System and drought area surveillance.

Background: In late FY 75, the Government of Ethiopia proposed, for implementation from FY 76 through FY 78, specific augmentation of short-term activities within Southern Ethiopia for which additional USG assistance was requested. These activities, in particular, included the following:

- a) Expansion of nomadic settlement and irrigated agricultural development within the Wabe Shebelle river valley.
- b) Expansion of nomadic settlement and irrigated agriculture within the confluence of the Dawa and Genale rivers.
- c) Initiation of integrated agricultural development in southern Gemu Gofa province, to include expansion of settlement in the Gato, Waito and Omo river valleys.
- d) Expansion of nomadic settlement and irrigated agriculture within the Awash river valley.
- e) Establishment of a Drought Area Surveillance and Nutrition/Health Early Warning System.

In consideration of these activities, which have represented to the Ethiopian Government the most comprehensive approach it could develop, not only to bring about immediate recovery, but to establish the beginnings of permanent and improved change in the character of life within the region, the Mission had identified all but (d), above, as both appropriate and feasible for additional USG support (see USAID/E PRP-Drought Recovery and Rehabilitation - Ethiopia, 12/31/74).

Since the submission of the PRP and identification of these activities, however, a combination of design timing and developing political events between Ethiopia and Somalia have effectively dictated Mission reconsideration of its initially anticipated project support.

In particular, while the Mission is compelled to concur in the current approach being taken by the Ethiopian Government to settle destitute nomads along the Wabe Shebelle, Dawa and Genale Rivers on the basis that these represent the only real and practical alternatives immediately available for some 75,000 destitute nomads dependent on relief support, the presence of guerrilla activity within these areas and the absence or hope of a riparian treaty between Ethiopia and Somalia presently render both the physical and management risks to the success of these endeavors so great as to preclude further USG consideration in the foreseeable future. For other reasons, predominantly continuing changes over time within the relevant ministries of the Government of Ethiopia and the absence of an agreed settlement and management policy, the Mission has reluctantly been forced to reconsider its anticipated support of an integrated approach to the problem of severely drought-stricken southern Gemu Gofa.

In considering again with the Government of Ethiopia the critical drought related problems still facing the country, the Mission once more assessed the overall situation, within the context which follows:

While a broad range of Ethiopian Government recovery efforts, with major assistance from bilateral and international donor agencies, have been undertaken in the previously struck areas of the northern and eastern parts of the country, only limited attention, principally through the USG and the World Bank (see Rangelands Development Project, IBRD, November/1975), until recently, has been directed toward the difficult problems affecting the approximately three million primitive and isolated inhabitants, representing the poorest of the poor in Ethiopia, of the country's southern lowlands ranging from Harraghe in the east to Gemu Gofa in the southwest. These arid provinces, composed almost exclusively of nomadic and semi-nomadic peoples, possess only the most rudimentary exigencies of governmental administration, virtually no social services and only the most limited communication. Alternatively ignored and fought over by the Ethiopian Government in the recent past, the region for the most part has remained fundamentally unchanged for a thousand years or more.

In these perennially arid lands of the south, drought, as such, represents less of a unique phenomenon than one of an extensive range of environmental factors, the existence, or absence, of one or more of which can mean famine, suffering and death. It has been suggested, for example, that not drought, but rather unusual and exceptionally favorable climatic conditions over the recent past, are legitimately the principal causative precursors of the recent crisis: ecologically fragile and without supporting infrastructure, much of the region's rangelands were overpopulated and over-grazed to the creaking point by uncontrolled and rapid expansion of nomadic herds and people during these periods; in non-rangeland areas, such as Gemu Gofa, nomadic

expansion in both good and bad recent times, have pushed primitive agriculturists from already marginal sedentary farming areas, increasing their isolation and vulnerability, not only to famine, but to endemic diseases such as malaria and trypanosomiasis.

The Government of Ethiopia, responding both to the specific drought crisis and in recognition of clear patterns of overpopulation, land use, misuse and limitation countrywide, has finally begun a fundamental address of its problems which include not only recovery of its southern areas, but the development of them for future generations. Nascent efforts now extend from the previously noted immediate settlement and agricultural training of destitute nomads within the five major river valleys of the region to the full-scale integrated development of these extensive areas. Expanded programs of range management are being implemented; land settlement and agrarian reform planning at the national level, which affect the lowland areas, has begun. Rural development, in all of its facets, keynotes the present and foreseeable future thrust of the Ethiopian Government.

This thrust, and all of these efforts, however, demand time during which specific environmental imbalance can again signal human suffering and death unless shorter term measures can be applied which will reduce or prevent such effects.

It seems clear that throughout the period of the recent drought, two distinctive structural deficiencies have marked the character of the Ethiopian Government's efforts to assist those stricken by the disaster; nowhere have these deficiencies been more apparent than in the southern lowlands: (1) the absence of an organization and system capable of providing sufficient information on which to base effective actions; and (2) the absence of a transportation system by which these actions could be translated into the saving of human life.

It is demonstrable that within those areas of Ethiopia where these deficiencies were being overcome prior to the drought, such as Tigre province, the severity of the disaster's impact was greatly lessened, the actuality of recovery substantially accelerated and the initial pre-conditions for future economic development established.

The activities within this project as now proposed do not represent the complete solution of problems presented by drought in Southern Ethiopia. Such solution, in fact, is contained only in the substantive removal of the full range of constraints affecting the rural poor, all of which conspire with drought or other natural factors to render human life and productivity difficult or impossible.

They do represent, however, a major contribution to the necessary condition which must exist before even basic survival can be assured; their complete attainment will permit effective problem identification and response, the absence of which at this time is a principal barrier in the drought affected areas of Ethiopia.

SECTION A

NUTRITION/HEALTH EARLY WARNING SYSTEM - DROUGHT AREA ASSESSMENT

PART II-A BACKGROUND

II.-A. Background: Nutrition/Health Early Warning System/Drought Area Assessment

A. Nutrition/Health Early Warning System

It has been widely agreed that a means of predicting and assessing Ethiopia's food supply system as part of an early warning against food shortage is an important Government priority. Building on activities which exist within Government ministries and agencies so that they are welded into an efficient, collaborative activity requires planning and cooperation between the agencies concerned. An interdisciplinary approach is justified on both technical and operational grounds. In the first place, the information required arises from a number of related fields. For example, the prediction and assessment of climatic conditions placed alongside the measurement of agricultural conditions and these in turn related to changes in market prices resulting from alterations in the supply-demand balance provides a broader understanding of changes in the food supply system than would be obtained by single disciplines working in isolation. The link between food availability and human health and nutrition completes a spectrum of information relating food to the human condition.* In the second place, if resources are shared, costs will be reduced.

Several factors influence the production of food in what is predominantly an agricultural subsistence economy in Ethiopia. Among these, the influence of climatic variations has been a major factor in the food shortages of the last few years. This activity, therefore, proposes a national system for collecting meteorological information and correlating this with the progress and performance of crops and the state of pasture and herds and in turn correlating this with the assessment of human nutritional status. It further proposed that a system

* Specifically the assessment of the human effect of food shortage relates the collection of meteorological and agricultural information in the following ways:

- a. It relates the assessment of the food supply system at the point at which the Agro-Meteorological component of the Early Warning System leaves off - namely food production, to food distribution within the community, food intake, the nutritional sequelae of food supply and the social background which allows communities to adapt to food shortage situations.
- b. It provides information which is immediately predictive of the effects of food shortages on human communities.
- c. It provides a direct assessment of the effects of food shortage in human terms.
- d. It provides contemporary information on food shortages and related problems from affected areas on which management decisions related to food and urgent rehabilitative measures can be based.
- e. Assessment of food production monitors the environmental factors affecting food supply; then an assessment of nutrition, health and social factors document the human side of the ecological balance.

of data processing and reporting be established which will relay rapidly to the Relief and Rehabilitation Commission, the Agricultural Marketing Board, the Planning Commission and other interested authorities, information which will predict and identify areas of food surplus and food deficit and the effects of the latter on the population. In the initial stages of the activity, quantitative predictions must necessarily be guarded. With the accumulation of data, however, it should be possible to define more precisely relations which exist between climate and agricultural production and thus predict more accurately the likely outcome of the agricultural activity in each area.

The need for an adequate and timely flow of data and most importantly for its integrated evaluation, related to the "early warning" of food shortage was recognized by an interministerial Technical Working Group (TWG) of the RRC. It recommended that a permanent reporting system be established to meet this need. The TWG was representative of the Civil Aviation Administration (meteorological Service), the Ministry of Agriculture (EPID and PPD), LMB, CSO and the Ministry of Education, ENI, the then Ministry of National Community Development and the Ministry of Public Health.

The objective was to establish a means of assessing the human condition and human environment both in the long term and within the context of food shortage situations.

This activity is directly related to the needs of Ethiopia inasmuch as there is a lack of information on food and nutrition for the planning of development priorities. The serious situation which now exists in pastoral areas is unlikely to improve in the near future and a continuous means of monitoring variables related to food and nutrition will continue to be required by the Chief Commissioner for Relief and Rehabilitation. However, we believe that the main part of this activity is concerned with the reporting of data at a national level on food and nutrition. For this reason, a flexible capacity is envisaged which can respond to information arising from the warning of impending food shortages rapidly and effectively. At the same time a level of activity related to the long term planning needs of participating agencies will be maintained.

An important principle maintained during the design of the activity was the intention to strengthen the capacity of participating government agencies to collect and process data relevant to their work and to the national planning machinery of the country.

In outlining these plans and proposals, therefore, the TWG had the following priorities in mind:

- the national need for reliable and contemporary information regarding food production and distribution, in areas prone to shortage, as an "early warning" of impending food production deficit;

- the accumulation of data for the long term planning needs of the country and more specifically those of the technical ministries and agencies concerned with food production and supply;

- the advantages to be gained by individual technical agencies from collaborative planning for data collection both at technical and operational levels.

Once the activity had been accepted as a government priority the Technical Working Group appointed a project implementation group (PIG) to take responsibility for detailing specific plans and work programs. The PIG is made up of full-time professionals from CAA, MOA, LMB, ENI, and CSO. Each is responsible within his own agency for activities related to the project.

B. Purpose and Relation to Drought Recovery and Rehabilitation

The recent drought in Ethiopia has drawn attention to and aggravated the ecological instability of many parts of the country. In common with other parts of the African sub-Sahara zone, Ethiopia can expect to encounter continued climatic variability. In addition, in many rural areas the balance between land productivity and population is precarious. For this reason, until measures to stabilize and improve the balance between food production and the needs of the people become effective, some regions of the country are likely to experience food shortages from time to time. In the pastoral areas where the drought has caused severe long term damage, food supply is likely to continue to be uncertain in the near future.

In order to reduce the vulnerability of Ethiopia's people to famine, the government is engaged in intensive rural development activity. In particular, the following are immediately relevant to this project: multifaceted rangeland development projects, intensified small farmer assistance projects, a national marketing management program, a national food security scheme, and a comprehensive pre-disaster planning program.

This activity will provide an objective and continuous analysis of food production and distribution as a basis for managing these and other activities. It will serve as an "early warning" of acute regional food shortage. It will provide information on which food security system management decisions can be made. It will provide the information on prices and flows on which marketing management decisions can be made. It will serve to identify areas where high priority development intervention is required. Over the years it will monitor the effectiveness of the steps taken to improve the production stability and distribution of food in Ethiopia.

This activity will provide resources not available within government agencies to implement the program rapidly as part of RRC's mandate to coordinate programs designed to protect the country from further episodes of famine.

Utilizing available field personnel and strengthening this structure by training and recruiting, it will establish a network of reporting agents in all parts of the country. It is anticipated that by the end of the three year implementation period in excess of 1,500 will be in position - most of them engaged in other development activities as well - all of them functioning as multi-purpose agents.

In cropping areas they will report on simple meteorological indices, thus strengthening the existing meteorological reporting service; they will report on the events of the crop calendar thus giving early warning of sub-standard crop performance; integrated with MOA's crop cutting production estimate, they will assess yield at harvest time. In addition, the flows and prices of grain will be reported from rural and main markets. In selected and representative sites, food consumption and nutrition and health status will be reported. This latter activity will be intensified if areas are identified which are at risk to acute food shortages.

In pastoral areas they will report on meteorological indices, the condition and variations in pasture biomass, the status of water availability for animals and humans, and the state, structure and condition of the herds. In addition, the prices and flows of animals and grains in markets servicing the rangelands will be monitored. Food consumption, nutrition and health status studies will be undertaken in selected and representative areas.

In general, this information will be aggregated on an ecological and population type basis for analysis and interpretation. Monthly reports will be produced as soon as possible after the information is received. In order to handle the estimated volume of data anticipated (75,000 data bits/month) and provide capacity to analyze the data matrix in a comprehensive manner over time, computer programs will be prepared and an efficient statistical and data processing support unit will be established within CSO. Data will be made available to this unit for processing and analysis, but will also go to the participating agencies for their own use in planning and programming development strategy.

At the completion of the activity, the Government of Ethiopia will have:

1. An effective early warning system against acute food shortage.
2. A data base for the management of national food security.

3. A basis for the management of marketing strategy.
4. A continuous appraisal of food production and distribution in the country.
5. A means of assessing the adequacy of nutritional conditions region by region.
6. A means of identifying the health status of communities in the country region by region.
7. A strengthened sectorial capacity for planning short and mid-term responses to unstable or inadequate food production or distribution patterns.

While the Relief and Rehabilitation Commission has sponsored and coordinated this activity, it is foreseen as a permanent facility within the planning structure of the Government.

C. Drought Area Assessment

For the past two years various government agencies have collected information regarding food production and the effects of food shortages in various parts of Ethiopia with particular emphasis on areas affected by the drought.

At the end of 1974 these various activities were "consolidated" under the aegis of the Relief & Rehabilitation Commission which delegated to the Ethiopian Nutrition Institute the responsibility of providing Secretariat facilities for the government agencies concerned. During 1975 various field studies were undertaken and reports issued in the name of the Consolidated Food & Nutrition Information System. These studies attempted to quantify the magnitude of the effect of drought on the food supply of various regions of the country (see Annex XIII).

At the same time, the Inter-ministerial Technical Group (TWG) which provided the technical direction for the activity planned the permanent system of data collection related to food and nutrition described in this paper.

As of November 1, 1975, the Relief and Rehabilitation Commission assumed full administrative responsibility for the inter-agency secretariat which will now operate under the name of "Technical Information Service" to indicate an even broader function. But, within this "service", "food and nutrition surveillance" will be the main operational activity for the time being.

Thus, present activities fall into two main categories. The continued surveillance of areas actually affected by drought or other causes of acute food shortage (DAA), and the establishment of a regular reporting system on food production, distribution and consumption (EWS).

Special surveillance of areas affected by, or at risk to, food shortage is justified by the continuing effect of drought (particularly in the lowland pastoral areas) and the certainty that the "Early Warning System" will not have developed full capacity for at least the first twelve months of its operation. The two activities are allied, however, and during the next twelve months every effort will be made to integrate carefully all surveillance activities so that resources will be used in the most efficient manner possible.

SECTION A

NUTRITION/HEALTH EARLY WARNING SYSTEM - DROUGHT AREA ASSESSMENT

PART II-B DETAILED DESCRIPTION

II.-B. Description: Nutrition/Health Early Warning System/Drought Area Assessment

Goal and Purpose: To preclude famine as a result of drought and natural disasters in Ethiopia through the establishment and operation of a national system of human environmental condition reporting, analyses and evaluation.

Nutrition/Health Early Warning System

This activity, to be implemented over a 36 month period by eight Ethiopian Government agencies in collaboration, will establish a means of monitoring food production, distribution and consumption in Ethiopia. The activity will be coordinated by a central secretariat and will strengthen the existing capacity of these agencies. It will collate the flow of information in a cross-sectorial fashion so that the manner in which the determinants of production influence food availability can be monitored on a regular basis.

Ethiopia has a sparse rural infrastructure, many areas difficult of access with poor communication facilities. The most fundamental baseline data about some areas does not exist. The EWS is designed to strengthen the rural infrastructure with special reference to providing early, predictive information about the adequacy of food supply. This means assessment of those areas traditionally vulnerable to climatic change, to the invasion of crop pests, to flooding as well as to the longer term effects of soil erosion, population pressure and soil exhaustion.

This project sets out to reduce the vulnerability of rural communities to famine by improving both the quality and the state of reporting and to present to government planners a body of information about the country as a whole which does not exist.

Specifically, the following elements are envisaged:

1. Increasing the number and coverage of meteorological stations in the country to conform with WHO recommendations; (CAA)
2. Establishing a regular crop performance reporting system built upon existing experience in crop surveys and national crop production estimates; (MOA) (Coordinated with MOA-IBRD loan agreement)
3. Establishing a regular reporting system on rangeland conditions and animal production; (LMB) (Coordinated with LMB-IBRD-ILCA rangeland development and monitoring projects)

4. Strengthening existing crop, animal and food price reporting from rural markets and establishing a reporting system to estimate flows of food commodities; (MOA and IMB)

5. Establishing a reporting system on the availability of food at a family level and strengthening the reporting of the nutrition and health status of the people; (ENI and MPH)

6. Strengthening the capacity of the Central Statistics Office to process a flow of data to produce regular, timely analyses of the information matrix in order to identify trends and to make predictive estimates of likely changes in the food supply systems of the country.

These objectives are built on existing government activities and, in particular, on the experience gained in the last two years during surveillance operations in areas affected by drought. Pilot activities have begun and will be expanded rapidly as the project moves into its full implementation period.

In order to achieve these objectives, the following will be required:

1. Recruitment of new field agents and training of existing and new field personnel in simple reporting techniques appropriate to the area and sector of operations. These multi-purpose agents will be regarded as a shared reporting facility by participating agencies.

2. The updating and integration of sectorial questionnaires.

3. The strengthening of communication links to ensure a rapid flow of information from the field for central processing.

4. The setting up of simple, efficient manual data processing system to handle the information in the first implementation phase.

5. The preparation of computer programs and data bank facilities for use when initial experience has resulted in a settled pattern of reporting and interpretive techniques.

The whole activity will be coordinated and directed by a "project implementation group" representing the expecting government agencies housed in the secretariat which in turn will be located with the central statistics and data processing support unit.

Cost

The total activity cost over the three year period is estimated to be U.S.\$ 6.7 million. The United States Government contribution will

total U.S.\$ 1,000,000. The Government of Ethiopia contribution in cash and kind is projected to U.S. \$ 2.2 million, or approximately 32.6% of the total activity cost, and other donors, 52.5%.

Budget Summary Breakdown by Source
(U.S.\$ 000)

	<u>USAID</u>	<u>SIDA</u>	<u>IBRD</u>	<u>UNICEF</u>	<u>WHO</u>	<u>GOE</u>
A. Secretariat	.423					
B. Drought area field operations		.281				
C. Statistical and data processing	.312					
D. Crop assessment			1.091			.224
E. Market and pastoral assessment	.221	.446 (2nd & 3rd years)				
F. Nutrition assessment		.373		.357 (salaries 2nd & 3rd years)		.066
G. Climate assessment		.742		.243 (equipment)		1.904
H. Health assessment					(Budget being negotiated)	
I. Inf/Cont	.044					
TOTALS	<u>1.000</u>	<u>1.042</u>	<u>1.091</u>	<u>.600</u>		<u>2.194</u>

AID Inputs:

AID assistance will be specifically directed toward the support of the central statistical and data processing center and, for the first year of implementation, toward the development of rangeland monitoring field capability as described herein.

The section which follows details the non-AID project inputs over the three year implementation period, but reference should be made to Part III.B. The source of data is the integrated field reporting network. The processing analysis and reporting of this information results in the project output-monthly reports as described above.

Non-AID Inputs

A. GOE

1. Project Implementation Group (Professionals) (in place)

- 1 statistician (CSO)
- 1 agricultural statistician (MOA)
- 1 livestock specialist (LMB)
- 1 meteorologist (CAA)
- 1 nutrition statistician (ENI)
- 1 education liaison officer (MOE)

2. Existing field staff apparatus

- Meteorological field staff - in particular 5 regional supervisors
- Provincial agricultural officers and EPID field staff
- Rangeland Development project field staff
- Three senior nutrition supervisors

B. GOE funds

As indicated in budget summary, Part III.B.

C. SIDA input

SIDA funds will support the following segments of the project:

- Mobile surveillance operations in areas affected by acute food shortage.
- Food availability and nutritional status reporting network.
- Expanded meteorological reporting network (excluding equipment).

SIDA has agreed to make available their funds within its Ethiopian "country frame" indicated in the summary, Part III.B. Presentation of a formal request through PCO is now underway.

D. IBRD inputs

The International Bank for Reconstruction and Development will support the following segments of the project:

- Crop performance reporting.
- Crop commodity market reporting.
- Pilot studies and components of rangeland monitoring.

MOA sub-activity has already been discussed with IBRD in the form set out in Part III.B. Minor modifications have been prepared to bring this component of the MOA-IBRD loan agreement in line with the activity. Both parties have agreed in principle and detailed negotiations are proceeding (see Annex XVII).

E. IICA inputs

The International Livestock Centre for Africa will provide technical advice and a research component as a result of pilot monitoring studies in selected rangeland areas in association with IMB/IBRD Rangeland Development Projects.

F. UNICEF inputs

UNICEF will support the following segments of the project:

Procurement of meteorological and other equipment.
Support of seminars and inter-country technical exchanges in Africa.

UNICEF has agreed to continue to support the activity. The level of support (see Part III.B.) has been approved by UNICEF in principle and is now awaiting formal agreement between UNICEF and the GOE.

(NOTE: UNICEF in collaboration with FAO, WHO and UNDP will provide support for an inter-country technical advisor to foster inter-country exchanges during the development of this project and similar activities in other countries in the Region.)

G. British ODM inputs

1 statistical advisor for one year (12 mm)
1 data processing advisor for one year (12 mm)

GOE has requested technical assistance from British ODM in the form of two technical advisors for a period of twelve months. One is to advise the senior statistician in the central statistical support unit. The other will assist in setting up the computer based data processing system. Recruitment is now underway in the UK.

H. WHO inputs

WHO has agreed to support the section of the activity related to health statistics as part of their program to assist the MPH to strengthen its planning base. However, this will be a fully integrated part of the overall activity. Full details will be available when discussions have been completed with WHO and budgets prepared.

WHO has indicated its readiness to support the implementation of MPH activities on request. Detailed work plans and budgets are being prepared.

Activity Design

A reporting system is established on a national basis to provide a flow of information on climate, agricultural production and human nutrition. For description purposes, this information may be divided into:

Meteorological information

- rainfall
- humidity
- temperature
- radiation

Crop information

- land preparation
- stages of crop development
- plant diseases and insect pests
- crop yield

Livestock information

- herd size and structure
- pasture conditions
- water availability
- herd condition

Market information

- livestock weights, prices and flows
- grain prices and flows

Nutrition

- the measurement of food stocks held by families
- the measurement of dietary intake
- the measurement of nutritional status

Health

- crude death rates
- age and specific mortality rates
- birth rates
- disease presence (specifically the identification of five common potentially epidemic diseases)

A system of reporting units is established throughout the country utilizing existing rural infrastructure (strengthening or extending this as necessary). Whenever possible, reporting points will serve more than one function (either reporting more than one category of information or serving as reporting agents in addition to their regular tasks).

Reporting stations will be located in accordance with the following principles:

- that adequate coverage of the country will be obtained, taking into account ecological variations.
- that information is obtained which will discriminate adequately between areas of surplus and deficit.
- that during the initial stages the assessment of human need will concentrate on areas vulnerable to or affected by food shortage.
- that the priorities of participating agencies will be preserved.
- that sampling considerations related to placement and density of reporting stations will be observed.
- that comparative information across technical boundaries will be obtained.

A system for regular, reliable and rapid transit of data from the field for processing will be set up. In certain circumstances this will involve the use of telephone and radio communications. More often the use of postal services will suffice.

It is proposed that computer based data processing be used to ensure the capacity required to handle rapidly the volume of data expected from the field.

Activity Working Objectives

1. To establish a means of monitoring and measuring meteorological and agricultural conditions throughout the year and by correlating these observations, develop a method of prediction and assessment of agricultural production.
2. To accumulate the data required to complete knowledge of the distribution of crops in Ethiopia - their planting, growing and harvesting times - and other relevant information.

3. To define and develop understanding of relationships which exist between climatic variations, food production, food and water availability, food storage, food consumption and the nutritional and health status of communities in Ethiopia.
4. To determine regularly the dynamics of inter-relationships which exist between food availability and demographic factors.
5. To determine regularly the status of family and community food stocks.
6. To assess regularly dietary intakes from a representative sample of population groups.
7. To assess regularly nutrition status of rural populations in Ethiopia.
8. To assess mortality, birth and disease presence in areas not covered by health institutions, shelters or mobile teams.
9. To establish the means of relaying rapidly to the Relief and Rehabilitation Commission, the Agricultural Marketing Board, the Planning Commission and all participating agencies the interpreted results of the data collected.
10. To strengthen the financial and material capacity of relevant participating Government agencies for data collection and processing.

Description of Proposed Sub-Activities (for summary see Table I)

In order to achieve the activity objectives, the following are proposed within the general areas of meteorology, crop production, livestock production and market economics. Individual participating agencies will be responsible for the implementation of the sectors of the field work relevant to their sphere of responsibility. Specifically this would involve:

- Meteorological Services of the Civil Aviation Administration in meteorological information.
- Ministry of Agriculture - Planning and Programming Department and EFID in crop information.
- Livestock and Meat Board in livestock information.
- MOA, Planning/Programming Department.
- Livestock and Meat Board in market information.
- Ethiopian Nutrition Institute in human nutrition.
- Ministry of Public Health in human epidemiology.

Field Activities

Climate

It is considered that 1,100 stations are required* as a minimum. Class I** stations have been sited with reference to scope, precipitation, distribution and climatic zones and the present need of the nation.

It is considered that during the project period, existing facilities should be built up to:

Class I stations	60
Class II stations	60
Class III stations	140
Class IV stations	750

Taking into account existing services, this means an increase of:

Class I stations	25
Class II stations	40
Class III stations	90
Class IV stations	450

It is proposed that new stations will be manned in the following way:

Class I stations by staff of area development projects, agricultural research institutes and meteorological services.

Class II & III stations similarly supplemented by staff of other Government extension agents, Health Centres and senior secondary schools.

Class IV stations by schools as an integral part of their curriculum and in certain areas by the Armed Forces and Police.

* Guide to Hydrometeorological Practices, WMO No. 1/68. TP82 (page III 9).

** Class I stations collect the full range of meteorological information. Class IV stations measure rainfall only. Class II and III collect data intermediate between Classes I and IV.

Crop Production

It is proposed that two categories of crop reporting stations be established in parallel with the structure of meteorological reporting.

District Level Agents

80 responsible for providing monthly reports on crop performance and for carrying out quantitative crop cutting surveys. They will be supplemented by 20 ENI-supplied district reporting agents.

Local Reporting Agents

260 located in cropping areas. Responsible for providing monthly reports on pheno-biological data observations under the supervision of district level reporting agents. These reporters will be recruited/trained locally.

Pastoral Area Surveillance

It is proposed that monthly livestock and pasture reports be obtained from 60 reporting points established in pastoral areas in the same localities as meteorological reporting points. These stations will be established in collaboration with ILCA who, in agreement with IMB, are undertaking an intensive study/monitoring program in selected rangeland areas. Organization and technical cooperation will ensure uniformity of technique where appropriate and will avoid duplication.

Two classes of stations will be established:

District level agents

In each awraja a full range of factors affecting animal production will be reported including: pasture condition, water availability, migration patterns, herd size and structure, animal diseases and mortality rates. Fifteen of these stations will be required.

Local reporting agents

Under the supervision of the awraja reporting stations, 45 reporting points will be established to collect a limited range of data. These stations will be distributed to insure representative coverage of the rangelands where ILCA reporting points do not exist, taking into account the problems of communication in these areas.

Description of Meteorological Stations

Class I - A typical Class I station is staffed by three full-time observers, although in some cases agricultural extension agents and water development field staff may work these stations on a part-time basis. They are equipped with instruments for measuring wind direction and velocity, temperature (air and ground), rainfall, radiation, pressure and evaporation. Automatic recording devices are a feature of these stations for aviation purposes; observations are made each hour. For agricultural purposes - twice a day.

Class II - These stations are used largely for aviation purposes. Class II stations are staffed by five qualified observers working on a 24-hour basis. They are equipped to measure wind direction and velocity, air temperature, rainfall, pressure and cloud observation. Hourly or three-hourly observations are recorded.

Class III - Class III stations are manned by high school students above 6th grade. They are equipped to measure air temperature, rainfall and significant weather phenomena. Observations are recorded twice a day.

Class IV - Class IV stations are manned on a part-time basis by local people of above 4th grade education. They are equipped to measure rainfall and significant weather phenomena only.

Market Information

Livestock

It is proposed to establish a regular reporting system from 60 market towns important in the livestock marketing system. Arrival and grain prices will be recorded (buying and selling) together with the weights and numbers of animals passing through each market.

Observations will be required on each market day. One reporter will be employed on a part-time basis with local assistance for weighing animals.

Grain

It is proposed that regular reports be received from 140 grain market centers during an initial twelve month period. During this time, the significance of information received will be judged critically and an attempt will be made to elucidate the relationships between production, demand and prices. This information will be used by AMC as a basis for making decisions on marketing policy. (see Annex XVII, IBRD, Annex 11).

Human Nutrition

Twenty project pilot stations have been established. These stations are responsible for obtaining a full range of nutritional information from the area. They are staffed or supervised closely by nutrition professionals. In addition, these stations collect a full range of meteorological and agricultural data. Eventually 80 nutrition reporting stations will be established to provide information on food stocks and nutritional status to complement agricultural information from the same area.

Health Reporting

As part of MPH rural health service development, a network of reporting agents will be established to provide regular information on the following: age specific mortality rates, birth rates, and the prevalence of common diseases. Five readily identifiable diseases, which occur frequently in Ethiopia in epidemic proportions, have been selected for reporting. Under the supervision of trained health workers, a member of each "farmers association" will report regularly on the health status of his community. This information, unbiased by a selection process, will supplement the statistics already available from health services throughout the country.

This reporting system will serve to complement food and nutrition information obtained from the same communities, will warn of impending epidemics, and will provide a basis for the further development of the country's rural health services.

Budgets are not yet available for this sector but are under active discussion. It is anticipated that WHO will provide any external assistance required for the implementation of health reporting.

Location of Reporting Stations

The preferred places for establishment of meteorological and crop reporting stations is as follows - although technical and sampling considerations will be taken into account:

- a. Daily meteorological reporting stations will be established at synoptic stations and other locations where radio transmitting facilities exist.
- b. Weekly reporting stations will be established at places which have radio transmitting facilities or telephone services.

c. Monthly reporting stations will be established at places which have postal services.

d. Class I stations will be established at synoptic stations, Agricultural College research stations, Agricultural Development Units, and other similar agricultural development units at "minimum package" centers of EPID and at large agricultural activity areas.

e. Class II and Class III stations will be established at extension stations of the Ministry of Agriculture, missions, at auxiliary stations of general Agricultural Development Units and other similar agricultural development units at schools, at large agricultural activity areas, health centers, and other areas which have Government agency extension personnel.

f. Class IV stations will be established at places where there are capable persons to take readings. The requirement for such types of stations is immense. Schools, police stations, missions, health centers, churches and other areas which have Government agency extension personnel are satisfactory. A large burden of this activity is likely to fall on the school system. It is proposed that this become part of the normal school curriculum.

Livestock reporting

Livestock marketing reporting stations will be located in the main livestock supply regions throughout the country. The pastoral area reporting stations will be located in the main nomadic areas of the country.

Nutrition reporting

Emphasis will be placed initially on areas vulnerable to or suffering food shortage, however, complete national coverage is envisaged when the project is at full strength. The following will be used as guidelines in placing reporting stations:

- a. Population densities.
- b. The parameters of sampling frame with particular emphasis on the grouping and mode of subsistence.
- c. Adequate statistical coverage of areas particularly those traditionally vulnerable to food shortage or which are known to produce higher than average incidences of under nutrition.

Sampling

It is proposed that a national sampling frame be established which will be comprehensive enough to take into account all categories of information within this proposal. While this may complicate its design to some extent, it will allow direct comparisons to be made between variables from different areas of information. The main factors determining the sampling frame are likely to be the following:

- ecological zone
- agricultural practices
- population type groupings
- community size
- population density

The precise sample size for the major variables involved will be determined as part of the detailed sample design.

For all reporting stations, strict sampling techniques will be required. This will allow limits of confidence to be established on the processed information.

Supervision

It is recognized that regular and frequent supervision is required in the field. This includes not only adequate quality control procedures but also a feedback to the reporting stations on the quality and value of the work produced. The recruitment and training of personnel required for supervising field activities must be carefully programmed. However, it is understood that technical advice and supervision will be the responsibility of the relevant participating agency. It is assumed that immediate supervision of data collection by schools will be provided by the educational personnel.

Training

The necessary training of field personnel will be provided by the participating agencies concerned.

Data transit

It is proposed that two mechanisms be used to move data from the field to Addis Ababa for processing.

- a. Certain categories of information from Class I and II meteorological stations will be sent by radio or telephone. Large areas do not have communication facilities so that radio "transceivers" will be required to obtain data rapidly from these areas.
- b. Remaining categories of data will be sent to Addis Ababa by post or other convenient means.

TABLE I - PROPOSED DENSITY AND NATURE OF REPORTING STATIONS

Category	Total No. Stations Required	Frequency		Stations now Regularly Reporting	Additional Required	Suggested Assistance	Data Required
		Observe	Report				
METEOROLOGY							
Class 1	60	1-3 hours	Daily	35	25	Area development proj. CAA, EPID, MES, Missions, AVA, Police, NWRC, Other project schools, etc.	Rain, temperature, humidity, pressure, wind, evaporation, radiation & weather phenomena, etc.
Class 2	60	3-6 hours	Weekly	20	40		
Class 3	140	Daily	Monthly	50	70		
Class 4	750	Daily	Monthly	300	450		
AGRICULTURE							
Awraja level	80	Weekly	Monthly	0	80	EPID Agents, Other agents Prov. Agric. Officer	Crop, land preparation, food situation, pests, disease
Woreda level	280	Weekly	Monthly	0	280		
Provincial level (supervisor)	10						
LIVESTOCK							
Market Reporters	60	All market days	Weekly	0	60	Met. stations, other Agric. Dev. Projects, Vet. stations, EPID, Schools	Weights and prices, number in market Livestock disease, pasture, water and pastoralists movements
Pastoral area Reporters	50	Weekly	Monthly	0	50		
Market (grain) data including animals/grain exchanged minor markets	140	Weekly (market days)	Weekly	0	140		

(Continued)

Category	Total No. Stations Required	Frequency		Stations now Regularly Reporting	Additional Required	Suggested Assistance	Data Required
		Observe	Report				
HUMAN NUTRITION Baseline data and pilot stations	20		Monthly	20	0	EPID, MNCD	
Nutritional status reporting	60	Monthly	Monthly	0	60	EPID, IMS, MNCD, CIP, other area development projects	Food acquisition, food stocks, dietary intakes, nutritional status, special studies Food stocks, nutritional status
HEALTH * Health institutions	50	Daily	Monthly		50	MNCD, Teachers, Missions, etc.	Mortality, births
Farmers association,	400	Monthly	Monthly		400	MNCD, Schools, Missions, etc. Local administration	Mortality, births, identification of five major endemic/epidemic diseases

* To be finalized

Drought Area Assessment

Objectives:

1. To assess regularly by interview, observation and measurement, factors which determine food production, distribution and consumption in areas affected by drought and the magnitude of the effect of shortage on the population.
2. To process and report this information rapidly as a basis for planning relief response and as a means of identifying rehabilitation priorities.
3. To provide predictive information which will allow the possibility of preventive emergency action.
4. To estimate the quantities of relief supplies required in seriously affected areas.

Plan of Operation

Field Operations

The activities proposed in this document are not new but are a continuation of surveillance carried out by the Consolidated Food and Nutrition Information System since the beginning of 1975 and before that by the Ethiopian Nutrition Institute, The Relief and Rehabilitation Commission and other government agencies. While maintaining field activities, a great emphasis in the next two months will be placed on gathering together the experience obtained to date, evaluating technical and procedural matters and introducing such modifications as are possible to improve data quality and reporting speed.

It is obviously not possible to foresee the events of 1976 which are significant to the food supply situation of Ethiopia. In rangeland areas the rainfall pattern has not yet clearly returned to normal. The immediate outlook in highland cropping areas is good but where rain-fed agriculture is only marginally possible, a further disturbance in the belg (short) rains could alter the situation dramatically.

Because the risk of belg rain disturbance is somewhat greater than krempt (long) rain disturbance, capacity is planned for surveillance of areas which are heavily dependent on belg production should this be necessary. Flexibility is clearly required at an operational level so that it is possible to respond to needs as they arise.

As a result of experience accumulated during the last two years, the methodology of data collection will be expended to reduce cost and increase efficiency. Although the use of mobile teams will remain a predominant method, information may also be collected by aerial survey techniques and from static reporting points as is appropriate to the circumstances. Thus, a three-tier integrated system is finally envisaged.

In line with a now established procedure, data will be collected from the field by teams trained and equipped to observe and record, in a quantitative fashion, information from which indicators of food production, distribution and consumption can be constructed. Initially at least, and in rangeland areas, they will be required to be mobile. Where field operations are ad hoc, direction and administration will come from the secretariat in Addis Ababa.

Market data is now being collected by reporting agents on a regular weekly basis. Other categories of information may also be collected in the future by this method. Through the Civil Aviation Administration and other government agencies, rainfall data is already available from established stations.

Data Processing

At least during the initial period, data will be processed manually. The experience gained in processing this data is a valuable exercise for the later development of computer-based data processing envisaged for the long-term reporting system (Early Warning System). As this is developed, capacity to process data from drought affected areas will be included.

System Reporting

It is appreciated that extra reporting capacity is required as a matter of urgency. The efficiency of reporting will be increased, however, with the standardization of questionnaire design and data processing. This is now possible and will be an important initial priority in the new activity period.

Awraja supervisors and above will be full-time employees. Awraja supervisors, in fact, report as well as supervising the work of part-time, locally recruited agents - farmers, police local administrators, etc.

The full-time people will have an administrative and professional responsibility toward their employing agency although they will be responsible for a wide variety of information.

It is anticipated that their contact with the local communities and the insight they derive from the feedback of interpreted information will give them a special place in the rural development structure.

Staffing (see Annex XV)

1. The Secretariat (Technical Information Service-RRC) is part of the Relief and Rehabilitation Commission. In addition to providing service support for agencies participating in the implementation of the "Early Warning System" the Secretariat will have executive responsibility for the implementation of "Drought Area Assessment" activities on behalf of the Relief and Rehabilitation Commission. It is responsible for:

Administrative support
Data collation
Collaborative reporting
Implementation progress reporting
Dissemination of technical information.

The staff required to carry out these activities are listed below:

Executive Secretary's Office

1 Executive Secretary
1 Assistant to the Executive Secretary
1 Accountant
1 Technical Reporting Officer
3 Secretaries
1 Messenger
1 Driver
1 Technical Advisor

Technical Information Unit

1 Chief
1 Technical Reporting Officer
1 Information Officer
1 Graphing & Mapping Assistant
1 Library Assistant

Field Operations Unit (Drought Area Assessment)

1 Head of Field Operations
3 Supervisors
18 Surveyors
6 Drivers

2. Statistical and Data Processing Unit

A statistical support and data processing unit has been established within CSO. This will be strengthened to provide capacity to process data rapidly arising from both EWS and DAA. This unit and the secretariat will be housed together.

The unit will be responsible for:

- Integrating statistical design.
- Developing national sampling frame.
- Integrating and review of questionnaire design.
- Preparation of training manuals.
- Providing data processing capacity (at first manual - later EDP).

The following staff will be required to fulfill these functions:

- 2 Statisticians (1 statistical advisor, ODM)
- 1 Data Processing Manager (1 data processing advisor, ODM)
- 3 Assistant Statisticians
- 1 Computer Programmer
- 6 Data Processing Assistants
- 4 Coders/Editors
- 5 Punch Machine Operators
- 1 Computer Operator (part-time)
- 1 Secretary

3. EWS Field Operations

During the life of the activity, field operations will be established progressively in all areas of the country. By the end of the third year of implementation, the following will be in place:

- 6 Sector Coordinators
(CAA, MOA, LMB, ENI, MPH, MOE - forms P.I.G.)
- 10 Senior Supervisors
- 31 Regional Supervisors
- 95 District Level Supervisors/Reporting Agents
- 1615 Local Reporting Agents/Observers

(Does not include drivers, assistants employed on a casual basis and farmers' association personnel.)

Training

Regional and senior supervisors are already experienced in their own technical fields. Orientation in other fields will be offered formally by the participating agencies and the secretariat and informally as they will work in the field alongside colleagues of other disciplines.

District level supervisors have been described from experienced surveyors used in the past by MOA, LMB and ENI. These will be trained by members of the P.I.G. over one to two week periods as appropriate in simple statistics, including the principles of sampling, meteorological recording, the significant events of crop growth, maturation, crop yield measurement, pasture assessment, the assessment of animal condition, market observation, the assessment of dietary intake and nutritional status. Special training will be given in simple human disease recognition.

Emphasis will be given to continued supervision and instruction in the field.

Locally recruited reporting agents will be trained in the field by supervisors with the assistance of P.I.G. members.

The present balance between workload and staff within CSO requires that in the first instance an "independent" capacity be created to preclude statistical support and data processing facilities. As the basic statistical work is completed (e.g., rational sampling frame is established) and the data processing becomes routine, this staff will serve to strengthen the overall capacity of CSO.

SECTION A

NUTRITION/HEALTH EARLY WARNING SYSTEM - DROUGHT AREA ASSESSMENT

PART III-A ECONOMIC ANALYSES

III.-A. Economic Analysis: Nutrition/Health Early Warning System/
Drought Area Assessment

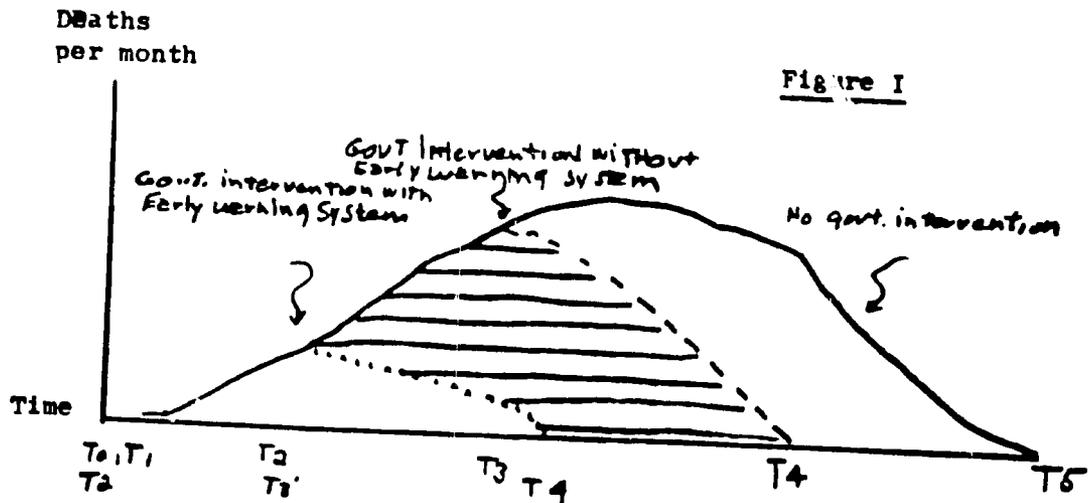
1. Benefits of the Early Warning System

The benefits of this activity are nonquantifiable for benefit/cost purposes. This is the case both because the benefits are for the most part intangible and thus not amenable to quantification and because the time at which benefits would generally accrue depend upon acts of nature which are unpredictable; this eliminates the possibility of discounting benefits since one does not know from what point in time to discount. Therefore, what follows is merely a qualitative description of the kinds of benefits (or costs not incurred) in future food-related difficulties.

The expected benefits can be disaggregated into three categories: (a) humanitarian benefits; (b) direct economic benefits, and (c) indirect benefits not specifically related to disaster warnings. Each of these will be discussed in turn.

a. Humanitarian Benefits

It is estimated that the drought which affected various parts of Ethiopia from 1971-75 resulted in 125,000 - 150,000 deaths. The early warning system will reduce the number of deaths occurring from a food related disaster because the timing of governmental response is extremely important in such a situation. This can be visualized using Figure 1.



At point T0, an observable difficulty arises, be that a lack of rainfall, an invasion of pests, signs of deterioration of rangeland from overstocking, etc. Depending on the type and severity of the problem, death begins occurring some time (T1 months) after the observable problem manifested itself. If no governmental intervention occurs, the number of deaths increases for a time and then as climatic conditions or population/ecological balances improve, the number of deaths taper off and normalcy (no more disaster-related deaths) returns at month T5. Total deaths being equal to the area under the curve from T1 to T5.

In the governmental intervention without an early warning system case, the government becomes aware of the problem at some point (month T2) after the observable phenomenon occurs, decides on a course of action and begins actual relief operations at month T3 causing disaster-related deaths to cease by T4. The early warning system will primarily affect the timing from the point when a problem is observable to when the government becomes aware of it. However, it should also reduce the time between when a decision is made for a course of action and the implementation of that action. The latter will result from having information on hand as to where and what supplies are available. In the case of the early warning system, T1/2 coincides with the origin and the earlier point at which government response occurs, T1/3 creates a much reduced loss of life and an earlier return to normalcy (T1/4). Total number of deaths reduced to area under curve T1/1 to T1/4. The shaded area represents the number of deaths averted as a result of the early warning system. While the actual number of lives saved would depend on parameters for which data are available, it is clear that in food-related disasters an early warning system can become a significant contribution to the reduction in the number of deaths which occur.

A second source of "benefits" is related to the growth and development of young children who are generally one of the most vulnerable age groups when food shortages occur. 24,000 cases of intensive feeding were reported in the Ethiopian relief shelters from June 1975 through April 1976. Virtually all of these were young children and pregnant women. Studies indicate that malnutrition during the fetal period and in infancy is associated with intellectual impairment. While the reversibility of this impairment is still being researched, it is only under ideal conditions that such would be the case. Since the "normal" life of an Ethiopian child is at subsistence level, chances for reversibility of the effects of malnutrition are minimal. This obviously has implications for the future productivity and other contributions to society of those affected, as well as the more purely humanitarian aspects. An analysis similar to that for

numbers of deaths averted could be used to estimate the numbers of children who are saved from the effects of severe malnutrition. Finally, the reduction in the level of overall misery of the entire affected population is an obvious though unquantifiable benefit of an early warning system.

b. Direct Economic Benefits

There are four categories of economic benefits to be expected from this activity. The first of these is an increase in efficiency in relief operations. Increased lead times to get grain stocks in place will reduce the logistics problems of port congestion, transport bottlenecks, storage facility shortages, etc. In many instances this will eliminate the need to airlift grain which in general is a much higher cost operation than ground transport. The sheer magnitude of the drought problems which faced Ethiopian authorities when the situation was recognized and the need to respond quickly resulted in the mobilization of many of the rural development agencies to help respond. This caused disruptions in their normal development operations, so much so in certain cases that entire activities had to be postponed. With an early warning system, any difficulties will be able to be kept under better control with much less of the disruption than has occurred in the past few years.

The second source of direct economic benefits arises from the reduction in food losses directly. This may be in the form of crops protected from pest invasions. In drought situations, crops will not be saved but, with sufficient warning, livestock could be sold rather than dying in the bush and yielding little or no return. In the past drought, it has been estimated that there were 6.5 - 7.0 million fewer cattle in Ethiopia than would have been under Fourth Five Year Plan projections (FFYP). ^{1/} Losses of sheep and goats were probably much less than this. The reduction in expected numbers of cattle were due to increased offtake in FY 72-73 and increased mortality. In 1973-74 cattle offtake exceeded FFYP projections by 360,000, indicating that this contributed a rather insignificant portion of overall number reductions. An early warning system will allow steps to be taken to increase the offtake. An obvious benefit ensues when compared to the alternative of the animals dying in the bush.

The third economic source of benefits arises from reduced rehabilitation requirements. An example of this from the recent drought is the cost required to provide oxen and seeds to allow farmers to resettle. The cost of this activity was \$ 4.2 million and was carried

^{1/} Source unpublished LMB material. The numbers used here are of rough orders of magnitude only. Mission estimates would put losses at something much less than this.

out by EPID in lieu of some of its regular program activities. When the severity of hardships resulting from a disaster is reduced, it is obvious that the level of pure rehabilitation will be similarly reduced.

The last source of direct economic benefits arises from the reduction of ecological damage, particularly from overgrazing. When environmental deterioration begins to occur, the early warning system will signal this and proper responses can be taken earlier. The severity of overgrazing can be reduced by increasing offtakes. This in turn reduces the longer term environmental deterioration caused by denuding the landscape. One economic disbenefit which must be considered is the cost involved with reacting to a situation which may not have evolved into a disaster situation. However, the other option - postponement of action until a disaster is assured - is such an untenable one that this possible overreaction must remain.

c. Indirect Benefits

Indirect benefits arise because of alternative uses of the data generated by the early warning system. Development planning efforts in Ethiopia are typical of those in most of Africa - extremely weak. Part of this weakness stems from the lack of adequate information on virtually all aspects of national life. The early warning system will help alleviate this dearth of material. Resultant planning efforts will be able to be more pertinent and effective.

While, as stated at the beginning of this section, it is impossible to quantify potential benefits because one cannot predict when and what type of potential disasters will occur and how severe they will be and because much of the beneficial results of the system are inherently unquantifiable, the range of expected benefits and the high value which must be placed on human life and suffering would seem to ensure that the early warning system activity is one worthy of undertaking. This conclusion is reinforced by the relatively small incremental costs of the activity.

2. Cost Effectiveness of the Early Warning System

There are three aspects of the early warning system which need to be analyzed from a cost effectiveness viewpoint; (a) how extensive is the area coverage to be, (b) how intensive is the coverage to be with area selected, and (c) what types of system to be established. Since the early warning system is to report on all manner of natural changes or problems, the system cannot be used to cover only drought prone areas. The ecology of Ethiopia is sufficiently fragile, the population pressures great enough in the relatively more favored areas,

the lack of knowledge of the susceptibility of areas to natural disaster great enough, and data and communications poor enough to warrant nationwide coverage. Anything less than this will permit potentially serious situations to develop undetected.

With regard to the intensity of coverage, the density of reporting points has received a great deal of attention during the activity design. Except for World Meteorological Organization recommendations (referenced in the text), no internationally accepted standards exist to provide guidelines. Thus proposed density and location of responding points were determined by the following factors:

- a. Utilizing the limited amount of data which exists, variances were calculated and "ideal" sample sizes determined.
- b. Attention was given to a stratification procedure in order to reduce heterogeneity and improve sampling efficiency.
- c. Cost considerations - the limiting factors were taken into account.

It should be noted that, except for meteorological observations, one reporting agent is not equivalent to a sampling unit. Each reporting agent will record observations on a number of locations/communities.

Two uncertainties reduce the degree of accuracy established by the theoretical considerations. Until a number of observations have been made and the significance of changes evaluated in real terms, the required degree of accuracy cannot be decided upon. Thus only an estimate of the required sample size can be made. Secondly, many areas of Ethiopia lie outside the scope of baseline surveys or studies which have yielded baseline data. Thus there is no basis for estimation of variance. Calculations of sample size have therefore been based on extremely limited information.

An important element in the internal technical evaluation of the activity is to determine the adequacy of the original sample so that the necessary modifications can be made.

In deciding upon the type of system to employ, two alternative systems to that chosen were considered. The first was to establish an independent system to collect data and analyze it in much the same way as the method chosen; since this would result in duplication of effort by existing data gathering systems and for a greater cost, the idea was abandoned. The second alternative involved gathering data via remote sensing satellite techniques rather than via ground crews.

While this approach will be tested in the coming years, it had to be rejected in the initial period. Before remote sensing techniques can be used, correlative data are necessary and these can only be obtained through ground observation. Remote sensing is thus impractical initially, but may be instituted once the correlative data are gathered through the approach selected.

SECTION A

NUTRITION/HEALTH EARLY WARNING SYSTEM - DROUGHT AREA ASSESSMENT

PART III-B FINANCIAL ANALYSIS - PLAN

III.-B. Financial Analysis and Plan
Nutrition/Health Early Warning System - Drought Area Assessment

The total cost of this three-year activity is estimated at \$ 6.7 million of which \$ 1.0 million will be financed with AID grant funds, \$ 3.5 million from other donors and \$ 2.2 million from the Government of Ethiopia. Of the latter, nearly 100% will be new budgetary inputs.

The following four tables illustrate aspects of the project:

Table I is a summary cost estimate and financial plan. As indicated, the \$ 6.7 million program is essentially local cost financing, 14.9% by AID, 52.5% by other donors and 32.6% by the Government of Ethiopia. 100% of the foreign exchange costs entailed will be borne by the GOE and other donors. The bulk of such costs represent commitments of the Government and other donors prior to the finalization of this proposal.

Table II is a funding summary reflecting total costs of the project by donor and B/G and the relationship between local and FX expenditures anticipated.

Table III is an annually time-phased summary presentation of project expenditures by source and application, according to component elements of the activity.

Table IV presents the financing plan for the project by major elements as a function of the input activities which contribute to their generation, scaled to expenditures of the life of the activity. Reference should be made to the Logical Framework Matrix attached as Annex X.

This activity will become a permanent feature of government activity. While the strictures of the recent drought conditions in Ethiopia have emphasized the need for surveillance of food supply in the country and the R&R Commission has been largely responsible for initiating this activity on the advice of the inter-ministerial working group which it convened, it is anticipated that the focal point of the project will move to the planning Commission (PCO). The housing of the Secretariat and Statistical and Data Processing Unit together within CSC is evidence of the Government's long-term plans. The added resources required urgently to strengthen the data gathering and processing capacity of the participating agencies are being provided for the present through RRC. It is planned that for the 1977-78 fiscal year budgets for the continuance of the project will be presented through PCO, and by the end of the implementation period (3 years) responsibility for the maintenance of the system will rest

entirely with the government. Recurrent costs of the activity at the end of the implementation period are estimated at \$ 1.4 million annually and are considered within the capacity of the GOE to assure continued operation.

Recurrent costs of the activity at the end of the implementation period are estimated at \$ 1.4 million (Eth.\$ 2.8 million). These costs will be absorbed by seven different agencies. The recurring statistical costs will be approximately Eth.\$ 213,000 and will be the greatest relative burden on any organization. The present FY 76 recurring budget is \$ 1.55 million for the Central Statistics Office which is a 6 $\frac{1}{2}$ % increase over the past two years. The relative costs for the other six agencies (MOA, CAA, MOE, MOPH, LMB and ENI) will be much less. The remaining recurring costs will be approximately Eth.\$ 2.6 million out of a total recurring budget for the six agencies of Eth.\$ 164.4 million (FY 76), which is a 27% increase over the FY 74 budget. The ongoing costs should not be difficult to absorb as part of the recurrent budgets, especially given the rate of expansion of them over the past two years.

Disbursement Plan

Under the proposed grant, the RRC is responsible to the JLG for the successful implementation of the sub-project to be carried out by the RRC Technical Information Service Secretariat.

The Secretariat has established a specific account with the National Bank of Ethiopia, distinct from the general accounts of the RRC, for the purpose of financial administration expressly for the operations of the Secretariat and the Nutrition Health/EWS-DAA. The Secretariat has additionally established its own financial/accounting administrative section for this purpose.

It is proposed that subsequent to signing the initial agreement and fulfillment of all conditions and covenants described herein as certified by the Project Manager, USAID/Ethiopia, specific disbursements will be made by USAID to the Executive Secretary, Technical Information Service, RRC.

Disbursements are planned as follows:

1. An initial advance not to exceed 20% of the total amount of the Grant;
2. Reimbursement for actual expenditures, less GOE taxes, fees or other charges, against authorized line item components of the approved budget shown as Table I, Section A, Part III.-B., up to the levels shown approved under the Grant. Reported expenditures will be used for both reimbursement and to liquidate the advance.

USAID disbursements shall be in Ethiopian currency only, calculated at the official rate of exchange in effect at the time disbursements are made. (The current exchange rate is Eth.\$ 2.05447 to U.S. \$ 1.00.)

Requests for advance/reimbursement by the GOE shall be prepared in accordance with such specific instructions/requirements as set forth in the Grant and/or as may be required from time to time by the Controller, USAID/Ethiopia.

EWS/DAA

TABLE I

SUMMARY COST ESTIMATE AND FINANCIAL PLAN
(000 \$US)

<u>Source</u>	<u>FX</u>	<u>AID</u>		<u>GOE</u>			<u>FX</u>	<u>Other^{1/}</u>	
		<u>Local</u>	<u>Total</u>	<u>FX</u>	<u>Local</u>	<u>Total</u>		<u>Local</u>	<u>Total</u>
Use:									
1. Equip	--	.046	.046	.934	.054	.988	.237	.056	.293
2. Hq. Spt.	--	.625	.625	--	--	--	--	--	--
3. Fld Spt.	--	.175	.175	--	.436	.436	--	2.703	2.703
4. Training	--	.110	.110	--	.611	.611	--	.199	.199
5. Inf/Cont	--	.044	.044	.104	.055	.159	.032	.306	.338
TOTAL		<u>1.000</u>	<u>1.000</u>	<u>1.038</u>	<u>1.156</u>	<u>2.194</u>	<u>.269</u>	<u>3.264</u>	<u>3.533</u>
Percentage			14.9			32.6			52.5

^{1/} UNICEF, IBRD, SIDA, ODM, WHO

EWS/DAA

TABLE II

FUNDING SUMMARY
(000 \$US)

	<u>FX</u>	<u>Local</u>	<u>Total</u>	<u>Percentage</u>
AID	--	1.000	1.000	14.9
GOE	1.038	1.156	2.194	32.6
Other ^{1/}	<u>.269</u>	<u>3.364</u>	<u>3.533</u>	<u>52.5</u>
TOTAL	1.307	5.420	6.727	100.0

1/ UNICEF, IBRD, SIDA, ODM, WHO

Schedule of Expenditures - Summary*
 Nutrition/Health Early Warning System
 1976/77 - 1978/79
 (Ethiopian dollars)

	<u>1976/77</u>		<u>1977/78</u>		<u>1978/79</u>	
	<u>Donor funds</u>	<u>GOE funds</u>	<u>Donor funds</u>	<u>GOE funds</u>	<u>Donor funds</u>	<u>GOE funds</u>
A. Secretariat	290,244	--	290,244	--	290,244	--
B. Drought area field operations	312,704	--	170,000	--	95,000	--
C. Statistical and data processing	213,200	--	213,200	--	213,200	--
D. Crop assessment	558,870	180,000	758,270	140,000	947,670	140,000
E. Market and pastoral assessment	453,930	N.B.	512,230	N.B.	426,830	N.B.
F. Nutrition assessment	328,550	47,800	477,550	39,800	715,560	47,800
G. Climate assessment	746,992	1,763,300	660,000	1,194,000	639,000	954,000
TOTALS	<u>2,904,490</u>	<u>1,991,100</u>	<u>3,081,494</u>	<u>1,373,800</u>	<u>3,327,504</u>	<u>1,141,800</u>

* Allowances for inflation and contingency have been included in all budget items in which this is expected.

Note: To be integrated with LMB Rangeland Development/ Monitoring, assisted by IICA.

SCHEDULE OF EXPENDITURES
1976/77 - 1978/79 (Ethiopian Dollars)

Existing Services	Project Input	1976/7		1977/8		1978/9		Target
		Item	Cost	Item	Cost	Item	Cost	
A. SECRETARIAT								
Skeleton staff manning Secretariat	Salaries, per diem & travel	Professional & support staff (See attach ___)	123,244		123,244		123,244	
Office block to be constructed	Office maintenance & supplies		157,000		157,000		157,000	
		Miscellaneous	10,000		10,000		10,000	
	Sub-Total		290,244		290,244		290,244	
B. DROUGHT AREA FIELD OPERATIONS								
6 Mobile Teams Supervision to be strengthened	Salaries, Per diem	Supervisors, surveyors, drivers	172,704	(phase out)	100,000	(phase out)	50,000	Run down as EWS picks up capacity
		Equipment	60,000	Replace- ment	10,000	Replace- ment	5,000	
		Maintenance	60,000	(phase out)	40,000	(phase out)	30,000	
	Miscellaneous	20,000		20,000		10,000		
	Sub-Total		312,704		170,000		95,000	

SCHEDULE OF EXPENDITURES

1976/77 - 1978/79 (Ethiopian Dollars)

Existing Services	Project Input	1976/7		1977/8		1978/9		Target
		Item	Cost	Item	Cost	Item	Cost	
C. STATISTICS AND DATA PROCESSING UNIT								
Head of Data Processing (CSO)	Salaries; per diem travel	Professional statistical & data processing staff (see budget)						1- Fully functioning data processing center - available at end of project for general service
Programmer (2)			116,920	116,920	116,920			
Statistician (P.I.G.)			7,200	7,200	7,200			2- Data bank facilities operational
No unused data or Program preparation facilities		Statistics advisor Data processing advisor	ODM					
18M Series 3 computer 16K core capacity (32K rental provided by project)	Office Maintenance Computer facilities	32K core storage graph plotter computer supplies						
Stand peripherals		Punch -verifiers	73,080					
	Miscellaneous		79,080		79,080			
			10,000		10,000			
	Sub-Total		213,200		213,200		213,200	

SCHEDULE EXPENDITURES

1976/77 - 1978/79 (Ethiopian Dollars)

Existing Services	Project Input	1976/7			1977/8			1978/9			Target	
		Item	Cost	GOE	Item	Cost	GOE	Item	Cost	GOE		
D. CROP ASSESSMENT Annual national crop production survey Annual qualitative area by area assessment survey	Salaries, per diem, travel	20 regional coordinators/supervisors		108,000			108,000			108,000	20 regional supervisors	
		80 reporting agents			Awraja supervisors						80 awraja supervisors	
		6 drivers	428,870		140 local agents	428,870			428,870			
	Supplies & maintenance	5 vehicles		60,000				140 local agents	134,400			280 local reporting
		20 office maintenance		12,000						20,000		
		80 office maintenance supplies, etc.	120,000							12,000		
	Miscellaneous		10,000			150,000				200,000		
	Sub-Total		558,870	180,000		758,270	140,000		947,670	140,000		Rapid transit of data to Addis on monthly basis

SCHEDULE EXPENDITURES

1976/77 - 1978/79 (Ethiopian Dollars)

Existing Services	Project Input	1976/7			1977/8			1978/9			Target	
		Item	Cost	GOE*	Item	Cost	GOE	Item	Cost	GOE		
E. LIVESTOCK MARKET AND PASTORAL ASSESSMENT												
20 livestock markets reporting prices	Salaries, per diem & travel	1 Coordinator									1 Coordinator	
		4 Regional supervisors									4 Regional supervisors	
		15 Reporting agents				15 Awraja supervisors					15 Awraja supervisors	
		**				45 Report-agents	43,200			43,200	45 Reporting agents	
		150 Market reporters										
	Supplies & maintenance	300 Assistants	268,630				268,630			268,630		200 Market reporting agents
		Equipment	91,500			50 Market reporters						400 Assistants
						100 Assts.	50,400					
	Miscellaneous	20 Office maintenance supplies, etc.	73,800			Additional equipment	30,000		Replacement	10,000		
			20,000				30,000					
		453,930	*			90,000			90,000			
					30,000			15,000				
					512,230	*		426,830	*			

* GOE contribution in LMB-IBRD Loan Agreement.

** Includes crop reporting.

SCHEDULE OF EXPENDITURES

1976/77 - 1978/79 (Ethiopian Dollars)

Existing Services	Project Input	1976/7			1977/8			1978/9			Target
		Item	Cost	GOE	Item	Cost	GOE	Item	Cost	GOE	
F. NUTRITION ASSESSMENT											
20 Pilot reporting points operating	Salaries, per diem & travel	1 Coordinator	168,250								1 Coordina- 2 Senior supervisors 5 Regional supervisors 5 Regional supervisors 80 Report- ing agents
		2 Senior supervisors									
		5 Regional supervisors									
	Supplies & maintenance	20 Reporting agents				20 Report- agents	168,250			168,250	
		Drivers, etc.		37,800							
		25 Office maintenance & supplies	90,300				90,300			90,300	
		6 Vehicles	60,000				60,000			60,000	
						Add'l main- tenance	50,000			50,000	
									Add'l main- tenance	50,000	
								5,000		5,000	
Miscellaneous	Equipment	10,000	10,000			10,000			10,000		
Sub-Total		328,550	47,800			477,550	39,800		715,580	47,800	

SCHEDULE OF EXPENDITURES
1976/77 - 1978/79 (Ethiopian Dollars)

Existing Services	Project Input	1976/7			1977/8			1978/9			Target
		Item	Cost	GOE	Item	Cost	GOE	Item	Cost	GOE	
G. CLIMATE ASSESSMENT											
35 Class I Stations	Salaries, per diem & travel	8 Senior supervisors									60 Class I
20 Class II stations		4 Regional supervisors									60 Class II
50 Class III stations		Technicians									140 Class III
300 Class IV stations		10-1 Observers				10-1			5-1		750 Class IV
		20-2 Asst. Observers				20-2			20-3		
		60-3 Drivers, etc. (including training)	143,492	82,000	40-3			100-4			
		150-4			200-4						
	Supplies & maintenance	Equipment	350,000	1,181,300		180,000	94,000		190,000	104,000	
		Office/equipment maintenance	228,500			350,000			350,000		
		Station maintenance incl. fuel & transport			500,000			500,000			500,000
	Miscellaneous		25,000			30,000			35,000		
	Sub-Total		746,992	1,763,300		660,000	1,194,000		639,000	954,000	

SECTION A

NUTRITION/HEALTH EARLY WARNING SYSTEM - DROUGHT AREA ASSESSMENT

PART III-C SOCIAL ANALYSES

III.-C. Social Analysis
Nutrition/Health Early Warning System - Drought Area Assessment

1. Beneficiaries

While this activity primarily addresses the need for better information about more of the country than has been possible so far, the fact that it is directed specifically towards food supply defines a population that stands to benefit -- those whose food supply is inadequate, precarious or in jeopardy from climatic change, population pressure or economic depression. Declared government policy is to address the needs of the poor and under-privileged as an urgent priority. By providing up-to-date information -- and advanced warning of detrimental changes -- government planning will be more efficient and its response to the plight of communities whose food supply is endangered more rapid and effective.

Although the main targets of this project relate directly to relief and food security, a number of spin-off benefits are anticipated. The communities themselves will be involved in gathering information. The sampling frame, for example, is based on farmers' associations. Inasmuch as the community itself will be responsible for assisting with the project, the people will gain an insight into their own problems which are frequently stated to be of a short-term nature rather than arising from profound ecological disturbances. There are obvious dangers in relying on a self-reporting system. The alternative means that a community feels that it is under scrutiny. By careful sampling methods, objective measurement techniques and careful supervision, it is hoped that bias introduced will be minimized. In the meantime, through a better appreciation of the causes of a community's problems - and regular feedback is part of the project design - it is anticipated that the community's efforts can be directed toward the causes of its problems rather than the short-term effects.

2. Spread effects

Because the regions of Ethiopia are still largely isolated and self-contained, spread effects are anticipated at a central level. The preparation of this project has entailed detailed inter-sectoral planning which already has resulted in an added appreciation of the technology available in other disciplines. But more importantly, the whole question of development as related to food supply has taken on a new dimension in two important respects. First, the inadequacy of food supply in many parts of the country has been presented forcibly and, as a result, the priority to increase agricultural production, not for its economic value but for its nutritional value, has been emphasized. Secondly, the value of a broad, inter-disciplinary

approach to the problem of identifying the causes and effects of inadequate food supply is reflected in the need to apply a combined multi-sectoral approach to providing the answers. It has been seen that health and nutrition are intimately related and dependent on rangeland management, on pest control, on water development, on soil conservation, on land use planning, and so on. The continued exposure of professionals from a number of disciplines to a pool of common information will continue to stimulate the inter-disciplinary exchanges required for balanced development policy making.

SECTION A

NUTRITION/HEALTH EARLY WARNING SYSTEM - DROUGHT AREA ASSESSMENT

PART III-D ENVIRONMENTAL ASSESSMENT

III.-D. Environmental Assessment
Nutrition/Health Early Warning System - Drought Area Assessment

This sub-project as proposed has no direct or indirect impact on the environment of Ethiopia. Indeed, the sub-project will be an accumulation and assessment of data describing environmental conditions as they relate to food and nutrition surveillance and the effects of these conditions on the population and its food supply in Ethiopia.

A full discussion of the effects and linkages is detailed in Annexes XII and XIV.

SECTION A

NUTRITION/HEALTH EARLY WARNING SYSTEM - DROUGHT AREA ASSESSMENT

PART IV-A IMPLEMENTATION ARRANGEMENTS

IV.-A. Implementation Arrangements
Nutrition/Health Early Warning System - Drought Area Assessment

GOE

The implementation arrangements for this project contemplate the continued coordination role of the Relief and Rehabilitation Commission (RRC) of the GOE. Despite particular weaknesses in this organization as discussed below, its present and projected status within the government over the life of this project, its overall organizational capability and leadership render it the single most appropriate body available to assure the successful completion of the project. In addition to its background and experience, both internally with the government and with AID, external donors and their procedures, the RRC's continued role is particularly relevant at this point in Ethiopian history which is reflecting almost daily structural and personnel changes within the traditional ministerial institutions of government; in fact, the RRC is almost the only institution at the ministerial level which retains sufficient stability, authority and internal respect to insure effective implementation. A discussion of the disarray affecting the traditional ministerial organs of government would be far too long to include here; suffice it to say, however, that the continued role of the RRC would appear to be indispensable to the success of this project. Additionally, the RRC is one of the few agencies of government at this time authorized to negotiate and execute assistance agreements in its own right on behalf of the government and assure adherence to their terms by cooperating and implementing institutions. Finally, the activities within the project are proposals developed pursuant to RRC planning and presented by it as priority efforts of the entire government to be administered by the RRC and, as such, reflect concurrence not only in the nature of their implementation, but in the continued role of the RRC.

Under the overall coordination of the RRC, two specific implementing agencies will carry out the objectives of this project. The first is an administrative sub-section of the RRC, the Technical Information Service (TIS), and the second, the Rural Roads Division of the Ethiopian Roads Authority (formerly the Ethiopian Highway Authority) (see Section B, Part IV.A., for background of ERA).

1. RRC - The RRC was formally established in April 1974 as an executive organ of cabinet rank reporting (at that time) directly to the Prime Minister. The RRC, reflecting the Ethiopian Government's growing concern with the gravity of the drought crisis, was authorized broad, almost martial law powers, to draw upon the country's domestic resources: men, money and materials, in dealing with it. A competent, respected and recognized high-level administrator - a sociologist and former Vice Minister of the Interior - was selected to head the organization.

In brief, the RRC's mandate was, and is:

a. To identify and assess the extent of drought and other natural disasters in Ethiopia and determine the actions and resources required to preclude and alleviate human suffering.

b. To request, receive, allocate, distribute and administer domestic and foreign assistance to accomplish the Government's objectives.

Combining with a growing domestic revolution, in significant part resulting from the drought crisis (which was to bring about the deposition of Haile Selassie in September 1974), the RRC quickly achieved enormous power, commanding an average budget of US \$ 25 million, headquarters staff of nearly 500 supported by thousands of military and civilian field personnel, a fleet of 400 vehicles and a chain of grain store houses with a capacity of 50,000 tons. By January 1975, the RRC had assumed the proportions of a "super-ministry" and, increasingly through 1975, the RRC began to take on responsibilities ordinarily reserved for more traditional institutions, particularly those of Planning and Agriculture, as those ministries became ravaged by revolutionary changes.

By mid-1975, the RRC, augmented further by an expatriate staff of UN and bilateral agency experts, found itself planning, funding and administering not only emergency drought relief, but general relief assistance of all kinds for all rural areas, short and medium term recovery activities, rural development programs, food for work projects and the stimulation, planning and coordination of longer term (i.e., up to 20 years) efforts aimed at addressing the fundamental rural environment problems of Ethiopia. The RRC was administering not only its immediate organization but sub-elements in water, roads, public health, sanitation, settlement and agricultural extension; many of these were nominally under appropriate technical institutions, but effectively controlled by the RRC.

Much of the RRC's growth and size was of necessity and in the face of substantial paralysis within other technical institutions of government; it resulted, however, in ponderous bureaucracy requiring heavy management support that detracted from the RRC's ability to deal with its first, essential mission: emergency relief assistance delivery.

Beginning in late summer, 1975, with the assistance of a former AID Public Administration Advisor provided through UNDP, the RRC began serious attempts to reorganize, reduce its cumbersome size and increase its overall effectiveness. In October 1975, reorganization plans, structuring the RRC along more functional lines, were approved by the Provisional Military Administrative Council (PMAC)

of the Government; authority to return unneeded/incompetent personnel to their sending agencies and other administrative changes was sought and obtained, as was authority for the RRC to employ personnel in its own right. Efforts to move the RRC to its eventual form of a core body concerned with disaster preparedness and emergency response were begun. These overall efforts to improve the RRC's focus and efficiency continue; progress, however, has been limited.

The RRC has been criticized, especially within the donor community, for its numerous administrative weaknesses, its frequently slow emergency response and for poor internal communication and management. Despite these (valid) criticisms, the RRC, with a minimum of experience, has been an effective vehicle for coordination of drought related foreign assistance; in particular, it has served extraordinarily well to cut through the normal inter-ministerial tangle affecting/retarding the receipt, delivery and distribution of relief commodities and has been markedly effective in stimulating attention and planning toward solution of drought problems. Its coordination role among those GOE agencies required to extend/expand their programs to deal with specific relief and rehabilitation questions continues to be well accepted and respected.

With regard to this project, the RRC role will not differ fundamentally from that assumed under the initial USG Recovery and Rehabilitation assistance program (Grant 663-F-601): it will administer the funds to be provided for support of the activities; manage and assure the successful implementation of the entire project. In the case of both activities, substantial inter-ministerial coordination and cooperation will be required; the mechanism of the RRC will continue to be employed to effect these objectives.

2. Technical Information Service/RRC

The Nutrition/Health Surveillance System activity proposed under this project comprises an interim Drought Area Assessment (DAA) program and the establishment and continuing operation of a permanent Early Warning System (EWS). Both programs will be implemented by an augmented Technical Information System Secretariat which is an integral sub-section of the RRC, provisionally established in the end of 1974 as a Consolidated Food and Nutrition Information Service (CFNIS). The CFNIS was an out-growth of an Inter-ministerial Technical Working Group (TWG) formed in late 1974 and composed of representatives of the Ethiopian Nutrition Institute (ENI), Livestock and Meat Board (LMB), Ministry of Agriculture (PPD and EPID), Civil Aviation Administration Meteorology Division (CAA/MET), Central Statistics Office (CSO), Ministry of Education and Ministry of Public Health. With advisory assistance through FAO and UNICEF, the TWG was charged by the Government of Ethiopia with the research, accumulation, analysis and evaluation

of all data pertaining to human and environmental conditions as the result of drought and disaster in Ethiopia. From this effort, the TWG was to produce reports and recommendations to the RRC relative to actions which should be taken with regard to those conditions. Among these recommendations were: (1) the establishment of a separate informational secretariat to be co-located with the RRC headquarters which would not only be responsible for receiving and disseminating relevant data, but for the coordination of data collection and obtaining such data, if required; and, (2) that a Project Implementation Group (PIG) be formed as a working committee of the TWG for the purpose of designing a specific program to monitor and assess, on a continuing basis, all conditions in drought affected areas which could serve as a permanent early warning system of potential famine crisis situations.

In November 1975, the provisional CFNIS was formally established as the RRC Technical Information Service (TIS). The TIS is headed by a permanent section chief who is a trained biostatistician. It is staffed by an experienced expatriate administrative officer and requisite technical, records and clerical specialists. As part of the proposed activity, the TIS will be upgraded to a full operating division of the RRC, with the present TIS function retained as only a divisional unit (see TIS Organization Chart, Annex XV).

The Mission has reviewed the proposed TIS secretariat and staffing as part of its consideration of the overall activity and considers that the organization as detailed will be capable of effective implementation.

It is proposed by the GOE that the TIS be responsible for the establishment and operation of the EWS/DAA Nutrition/Health System for a maximum period of 36 months. According to the proposed Implementation Plan, the entire operational system will, at the end of this period, become the responsibility of the Planning Commission.

AID

The Mission is proposing no significant changes in either the method of implementation, nature of AID-host country relationships under the project agreement, or in Mission organization relative to the implementation of this project from that presently employed in carrying out AID responsibilities under the Ethiopia Recovery and Rehabilitation Program (663-F-601).

Overall project manager responsibilities will be maintained within the Mission's Drought Rehabilitation Division with specific activity officers assigned functional responsibility for day-to-day monitoring and evaluation of activity implementation progress.

In light of the successful and effective implementation of related activity being funded under the prior recovery grant, the Mission is of the view that existing AID implementation procedures, staffing and organization are sufficient for the attainment of project goals as proposed.

SECTION A

NUTRITION/HEALTH EARLY WARNING SYSTEM - DROUGHT AREA ASSESSMENT

PART IV-B IMPLEMENTATION PLAN

IV.-B. Implementation Plan
Nutrition/Health Early Warning System - Drought Area Assessment

Early Warning System

In order to provide a means of predicting and assessing food supply on a long-term basis, the Inter-ministerial Working Group has proposed that a simple system of regular reporting be established throughout the country (early warning system).

The early warning system will be implemented by government agencies already having responsibilities in the various technical fields concerned and will be carefully integrated with existing or planned activities such as the Ministry of Agriculture's crop cutting surveys and rangeland monitoring planned in conjunction with the Livestock Development Corporation's rangeland development projects. It will be further assisted by other participating agencies (e.g., the Ministry of Education) which have local personnel in widely distributed areas. Information arising from these activities which is directly related to the assessment of food production, distribution and consumption will be made available for centralized coordinated processing and evaluation by the Technical Information Service in collaboration with the Central Statistics Office.

Drought Area Assessment

In view of the reduction of rainfall in rangeland areas, there is need to continue activities in the lowlands of Harraghe, Bale, Sidamo and Gemu Gofa. Based on the experience obtained to date, these areas will be monitored closely in order to assess the magnitude of drought effect and to assist in identifying the priorities for relief activity.

The late effects of drought and the vulnerability of some cropping areas to episodes of shortage may mean that surveillance has to be extended to them as well during the coming year.

In general, these activities will continue in response to the needs of the Commission until the capacity of the "early warning system" has been built up and may subsequently be required in areas which have been shown by the "early warning system" to be suffering from severe food shortage.

As part of its work, the Technical Information Service in collaboration with other government agencies will assist the Chief Commissioner in determining overall relief requirements.

The Secretariat

This is part of the RRC and will be housed within it. It will be responsible for three areas of activity:

- the execution of "Drought Area Assessment."
- the collation and evaluation of information arising from the early warning system.
- the support of the activities of the Inter-ministerial Technical Working Group.

To fulfill these functions, a technical and administrative staff is required. The organizational structure proposed is set out in Annex XV. It will be noted that the staff structure includes a capacity to carry out field operations in drought affected areas and reflects the data processing capacity required to transform data arising from activities in drought affected areas and from the early warning system into reports on which action can be based.

An important part of the Secretariat function will be to continue to supply a point of coordination and communication between agencies participating in the Technical Working Group. The TWG provides a forum for inter-disciplinary discussion and evaluation of activities related to the assessment of food production and consumption in the country. It is, therefore, concerned with such topics as the methodology requiring further study or research and ways in which techniques developed in one discipline can strengthen activities in others.

The following agencies will implement the activity in collaboration:

- The Relief and Rehabilitation Commission will provide secretariat support facilities for overall coordination; in particular the Secretariat will house the project implementation group (PIG) which is immediately responsible for directing the activity.
- The Civil Aviation Administration (CAA/Meteorological Division) will be responsible for meteorological reporting and interpretations.
- The MOA (PPD and EPID) will be responsible for crop performance reporting and market reporting of commodities and data interpretation.
- The LMB will be responsible for rangeland and animal production surveillance together with livestock market reporting and interpretation.
- ENI will be responsible for family food availability and consumption studies and the reporting of nutritional status together with the interpretation of this data.

- CSO will be responsible for providing overall statistical support and data processing services and for the statistical analysis of the consolidated data.

- MOE will assist by providing teachers and students to act as reporting agents.

Definition of Responsibilities

RRC has set up a secretariat to coordinate the collaborative planning and implementation of the activity. Specifically, the secretariat is responsible for:

- a. providing support for the Project Implementation Group (PIG) - representing all participating agencies implementing the activity.
- b. providing support for the inter-ministerial technical working group (TWG) which provides overall technical support for the activity.
- c. the administration and execution of ad hoc field activities to investigate and if necessary monitor conditions in areas shown to be vulnerable to acute food shortages.
- d. overall accounting and records including implemental progress reports to USAID on behalf of RRC.
- e. coordinating implementation to ensure an efficient use of resources and operational integrity.

CAA will be responsible for:

- a. setting up and maintaining an expanding network of field stations.
- b. procuring meteorological equipment.
- c. recruiting and training observers.
- d. supervising meteorological operations in the field.
- e. interpreting meteorological data.
- f. accounts for funds provided from RRC.

MOA will be responsible for:

- a. setting up a network of crop and market reporting stations.
- b. procuring and maintaining crop reporting equipment.
- c. recruiting and training crop reporting agents.
- d. supervision of crop reporting.
- e. interpreting crop information.
- f. accounts for funds provided for crop reporting.

LMB will be responsible for:

- a. setting up a system of rangeland monitoring and livestock market reporting.
- b. procuring equipment for this system.
- c. recruiting and training field personnel.
- d. integrating this activity with those planned by ILCA.
- e. supervision in the field.
- f. interpreting rangeland and animal production and market data.
- g. accounts for funds provided through RRC for rangeland and animal production monitoring.

ENI will be responsible for:

- a. setting up a network of field extension agents who will collect information on food consumption and human nutritional status.
- b. procuring nutritional measuring equipment.
- c. recruiting and training nutrition extension agents.
- d. supervising food consumption and nutritional status assessment activities.
- e. interpreting nutritional data.
- f. accounts for funds provided through RRC for these activities.

MOPH will be responsible for:

- a. collecting epidemiological, health status information.
- b. supervising health and mortality data collection.
- c. interpretation of health statistics.
- d. accounts for funds provided through RRC for these activities.

CSO will be responsible for:

- a. setting up a statistical and data processing support unit.
- b. recruiting professional personnel to man the unit.
- c. recruiting and training middle level data processing staff.
- d. providing manual data processing facilities during the initial stages of the activity (personnel in post).
- e. preparing computer programmes.
- f. providing adequate computer facilities.
- g. accounts for funds provided through RRC to strengthen existing statistical and data processing capacity for this activity.

Field Operations

Based on the experience of participating agencies and the activities of the RRC in areas affected by drought, questionnaires have been designed and prepared in Amharic. These will require refinement

and consolidation in the light of further experience. Twenty reporting agents are already in post recruited by ENI. Seventy reporting agents are being trained by MOA to reinforce this number. LMB will recruit and train fifteen pastoral area reporting agents and 100 market reporting agents in the first year of implementation.

These reporting agents will together provide an initial coverage of the country at an awraja level. In addition to information on the major elements of the food supply situation, they will collect basic data of a qualitative type on which a statistically valid sampling and stratification design can be based. In addition to its present field staff, CAA will recruit and train one hundred and four technicians and observers (some on a part-time basis) during the first year of the implementation period. The field agents will be supervised by twenty-nine regional supervisors drawn from CAA, MOA, LMB and ENI. Each will be responsible for an area, for the accuracy and speed with which data is obtained and for its rapid transmission to Addis Ababa.

In the second and third years of the implementation period, the number of reporting agents will be increased - the first generation's reporting agents becoming awraja supervisors. In the light of the information and experience gained, questionnaire design, sampling design and measurement techniques will be revised and updated. From the beginning of the second year of implementation every effort will be made to reduce the amount of subjective and qualitative information obtained. The development and verification of "food supply system" models will assist in refining and selecting from the initial range of data those variables which provide most powerful predictors and indicators of food production, distribution and consumption.

During the implementation of the activity, the applicability of other data sources such as aerial and satellite based remote sensing techniques will be explored. However, such is the paucity of ground information available from many areas of Ethiopia, that a considerable amount of ground work will be required before the benefits of these techniques can be utilized fully. Contact has already been established with sources of technical and practical information regarding remote sensing and this technology will be built into the activity at the appropriate time.

As and when required, mobile teams will be sent to areas which have been shown to be vulnerable to acute food shortage. These teams are already trained and in operation in the rangelands in the south of the country. It is anticipated that the level of this activity will decrease as the permanent reporting system gains capacity.

Central Support Unit

The secretariat and the statistical and data processing support unit will be housed together. This is the central core of the activity providing the cohesion and direction required. The project draws together and utilizes techniques developed in a number of separate fields. Their integration on the breadth envisaged in this activity is new. Thus, a strong central support unit to assess, modify coordinate and direct the evolution of methods and operation is essential. In addition, the success of the activity depends on the validity and timeliness of the information passed to the various government bodies responsible for initiating the appropriate responses. The central unit is, therefore, crucial to the success and quality of the venture. The activities of the central unit fall into three categories:

a. Administration and Support (Secretariat - RRC)

The secretariat staff is drawing up documents outlining accounting procedures. It will be responsible for accounts and records for the activity as a whole on behalf of the RRC. It will continue to provide support for the PIC and TWG. It will continue to insure that the necessary and relevant technical and professional contacts are maintained within Ethiopia and abroad. It will provide a source of information for government agencies and others on the output of the program.

b. Statistical Support(CSO)

The professional staff not already in place will be recruited as a matter of urgency. The statistical staff will review with the statistical staff of the other government agencies questionnaire design and draft output formats. Together with the statistical staff of CSO they will work towards establishing a comprehensive national sampling frame. On the basis of existing information and data from the field, they will establish the necessary parameters for valid stratification on the basis of ecological and demographic characteristics. They will provide advice and coordination in the development of the system as a whole.

c. Data Processing (CSO)

The present manual data processing capacity (six data processing assistants and three statisticians) will be strengthened by the recruitment and training of four editors and coders. Questionnaires used in drought area surveillance have already been coded for electronic data processing. However, during the first twelve months of the activity manual data processing capacity will be maintained until computer programs have been written and tested.

One punch machine operator will be recruited immediately and another dour during the first half of the first implementation year. Existing data will be punched onto 96 column IBM cards as a data file for use during the development of computer programs.

It is anticipated that it will take twelve months to prepare comprehensive computer programs for the activity. Much of this is innovative work which will evolve as the activity proceeds. Fundamental steps in the process are the following:

1. Definition of output format (in consultation with other participating agencies).
2. Definition of provisional stratification parameters.
3. Definition of provisional sampling frame.
4. Review and consolidation of questionnaires.
5. Review and validation of "food supply system" models.
6. Layout of computer program modules.
7. Preparation of programs.
8. Establishment and continuous update of data file.
9. Development of data bank facilities.
10. Testing of computer programs.
11. Evaluation and modification of steps (1) to (7).
12. Feedback to field personnel of activity results, method modifications and sampling instructions.

The staff of the statistical and data processing unit will comprise the following:

- 1 Data Processing Manager
- 5 Statisticians (4 in post)
- 1 Computer Programmer
- 1 Computer Operator (part-time)
- 5 Punch Machine Operators
- 6 Data Processing Assistants (in post)
- 4 Coders and Editors
- 1 Secretary

A data processing advisor and a statistical advisor are being provided by the British ODM for one year.

Reporting

The secretariat, for the RRC, shall provide USAID with regular financial and physical implementation progress reports on not less than a quarterly basis as described in the sub-project implementation agreement which will summarize the implementation status of the sub-project problems connected therewith and efforts being undertaken to assure successful completic...

Workplan Specifics

At the commencement of the first full implementation year, the following will have been achieved:

- 20 reporting agents in post (ENI)
- 70 reporting agents in post (MOA)
- 21 market reporting agents in post (LMB)
- Professional staff for central unit recruited (CSO and RRC)
- Meteorological equipment for 5 1st class
- 50 3rd class
- 50 4th class stations in the country.
- Mobile drought area assessment teams already operating.

Field Operations

- (a) Drought area assessment teams continue operations.
- (b) All agencies tender bids for procurement of additional equipment and supplies.
- (c) All agencies recruit and train additional field personnel at quarterly intervals.
- (d) Increased density of reporting agents.
- (e) Increased information flow.
- (f) Upgrade of field technique.
- (g) Upgrade of field technique.
- (h) Increased density of reporting points.
- (i) Modification of sampling procedures.

Central Unit

- Review and consolidation of questionnaires in collaboration with all agencies.
- First information received from field.
- Definition of provisional output format, stratification and sampling design.
- Review of questionnaire design - questionnaires computer coded.
- Preparation of computer programs begins.
- Initial output processed manually. Refinement and validation of food supply models.
- Definition and refinement of interpretive criteria.
- Review of selection of indicators.
- Field data used to validate models.
- Computer programs tested.

Field Operations

Central Unit

(j) Continuous cycle of review, modification, update, review

First data processed for reporting by EDP.

1977-78

(a) Drought area assessment teams continue operations if required.

Phase in of EDP DAA.

(b) Further recruitment and training of field agents to reach target number by end of year.

Phase in of EDP.

(c) Modification of field techniques on basis of experience to reduce qualitative reporting to a minimum.

National sampling frame complete - review of questionnaire design and sampling procedures.

(d) Possible introduction of remote sensing techniques.

Investigation of technology related to surveillance methods.

(e) Continuous evaluation and upgrade.

Review of output format and computer programs.

1978-79

(a) Reporting agents at target number.

Complete program evaluation.

(b) Evaluation, questionnaire review, review of techniques, review of sampling and stratification.

Integration of unit within CSO work plan by end of period.

Objectives/Targets by Agency - by year

1. Existing at commencement of activity

- 20 ENI pilot stations reporting for all agencies.
- 80 field agents recruited, trained and posted by MOA.
- 20 livestock agents recruited, trained and posted by LMB.
- RRC drought area field activities continuing two year experience.
- CAA met. equipment ordered for
 - 5 Class I stations
 - 50 Class III stations
 - 50 Class IV stations

Provisional consolidated questionnaire designed and output format design completed by CSO.

Internal review to be conducted quarterly throughout life of project by PLG and TWG.

2. Objectives

<u>1st year</u>	<u>Agency</u>	<u>Target</u>
Provisional national sampling frame established.	CSO	Compl. 3 mos.
Review output format.	CSO	Compl. 3 mos.
First quarterly progress report.	SEC	3 mos.
First basic information reports from field.	ENI, LMB & MOA	Compl. 2 mos.
Review of national sampling frame design.	CSO	Compl. 4 mos.
First consignment meteorological equipment arrives.	CAA	Arrives 1 month
Staff for 5 Class I, 50 Class III and 50 Class IV stations recruited, trained and posted.	CAA (LMB, ENI, MOA & MOE)	Posted 4 mos.
15 rangeland reporting agents recruited, trained, posted and equipped.	LMB	Posted 4 mos.
Additional 50 livestock and grain market reporting agents recruited, trained, equipped and posted.	LMB, MOA	Posted 6 mos.
First consolidated report from field processed.	All	Compl. 5 mos.
Second quarterly progress report.	SEC	6 mos.
First tripartite review for - review of questionnaire design - review definition of output - review national sampling frame - review national organization	PIG	At 9 mos.
First computer program ready for testing.	CSO	Ready 9 mos.
Third quarterly progress report.	SEC	9 mos.

<u>Objectives</u>	<u>Agency</u>	<u>Target</u>
50 additional livestock and crop market reporting agents recruited, trained, and posted.	LMB, MOA	Posted 10 mos.
Meteorological equipment for 50 Class I, 20 Class II, 10 Class III and 100 Class IV stations arrives.	CAA	Arrives 9 mos.
135 meteorological reporting agents recruited, trained and posted.	CAA (LMB, MOA & MOE)	Posted 10 mos.
Fourth quarterly progress report.	SEC	12 mos.
<u>2nd Year</u>		
50 crop and livestock market reporting agents recruited, trained & posted.	LMB, MOA	Posted 13 mos.
45 local rangeland reporting agents recruited, trained and posted.	LMB	Posted 14 mos.
20 nutrition reporting agents recruited, trained and posted.	ENI	Posted 14 mos.
Fifth quarterly progress report.	SEC	15 mos.
140 local crop reporting agents recruited, trained and posted (agents with 1-year experience become supervisors).	MOA	Posted 15 mos.
2nd Tripartite review.	PIG	Review 15 mos.
1st electronic data processing consolidated report.	CSO	Compl. 16 mos.
Meteorological equipment for 10 Class I, 20 Class II, 40 Class III, and 200 Class IV stations arrives.	CAA	Arrives 17 mos.
10 Class I, 20 Class II, 40 Class III, and 200 Class IV meteorological agents recruited, trained and posted.	CAA	Posted 18 mos.
Sixth quarterly progress report.	SEC	18 mos.

<u>Objectives</u>	<u>Agency</u>	<u>Target</u>
Final review output questionnaires sampling frame.	All	Compl. 21 mos.
3rd Tripartite review.	PIG	Review 21 mos.
Seventh quarterly progress report.	SEC	21 mos.
Eighth quarterly progress report.	SEC	24 mos.
<u>3rd Year</u>		
Manual data processing phased out.	CSO	Phased out 25 mos.
140 local crop reporting agents recruited, trained and posted.	MOA	Posted 26 mos.
40 nutrition reporting agents recruited, trained and posted.	ENI	Posted 26 mos.
Ninth quarterly progress report.	SEC	27 mos.
4th Tripartite review.	PIG	Review 26 mos.
Equipment for 5 Class I, 20 Class II, and 100 Class IV meteorological stations arrives.	CAA	Arrives 26 mos.
5 Class I, 20 Class III and 100 Class IV meteorological agents recruited, trained and posted.	CAA	Posted 30 mos.
Tenth quarterly progress report.	SEC	30 mos.
Field reporting agents at target number.	All	Compl. 30 mos.
Eleventh quarterly progress report.	SEC	33 mos.
Twelfth quarterly (final) progress report.	SEC	36 mos.
Final Tripartite review.	PIG	Review 36 mos.

SECTION A

NUTRITION/HEALTH EARLY WARNING SYSTEM - DROUGHT AREA ASSESSMENT

PART IV-C EVALUATION PLAN

IV.-C. Evaluation Plan
Nutrition/Health Early Warning System - Drought Area Assessment

Evaluation Plan: This sub-project has no operational precedents. In national and international circles, "early warning" and monitoring systems where food supply is vulnerable have been declared to be necessary. While techniques have been worked out and tested in limited contexts, integration on a broad base and application as a fully functioning system has not been attempted before. Evaluation, therefore, is not only important - continuous review is an integral part of the workplan as described herein - but must also contain a strong element of technical examination.

For these reasons, it is proposed that evaluation be carried out on three levels and are scheduled as established in the Implementation Plan (Part IV) and the Project Performance Track (PPT).

First: An overall progress review, as a basis for continuing evaluation, will be formalized in sixteen sequential quarterly reports. These internal reports shall:

- a. Set forth the implementation status of the sub-project in relation to the goals and objectives established;
- b. Assess the individual progress of each participating agency toward its goals and objectives;
- c. Identify problems affecting the implementation and indicate actions taken/required to resolve them.

Second: Five (biennial) formal evaluations will be carried out as shown in the implementation plan and PPT on a "tripartite" basis - representing the GOE, USAID/E and participating donors, and an independent technical expert chosen jointly by the GOE and donors. Evaluative elements which include output targets, progress indicators, baseline data and planning assumptions have been incorporated in the project design and are listed in the Logical Framework Matrix and discussed in detail in the general workplan. Each scheduled evaluation is planned for a period of 30 days. In general, the evaluations will consist of these summary elements:

- a. A review of the status of implementation;
- b. A technical review;
- c. A review of the use and usefulness of the information produced by the sub-project.

A format for the evaluation will be agreed upon by the senior staff of the activity and donors before the first scheduled evaluation. The object of these evaluations is also to allow opportunity for exchange and operational assessment so that the strategy and implementation modifications, if required, can be agreed upon. Discussions to determine the precise composition of the review group, its specific terms of reference and the form and scope of its reports will be held immediately following approval of the project.

Third: As an additional internal measurement, a specific Project Appraisal Review (PAR) will be conducted by USAID/E and GOE project personnel at the completion of each full 12 months of implementation of the sub-project.

SECTION B

SOUTHERN GEMU GOFA DROUGHT AREA ROADS

PART II-A BACKGROUND

II.-A. Southern Gemu Gofa Drought Area Roads

Gemu Gofa lies in the southwest of Ethiopia with Sidamo Province to the east and Keffa Province to the west and north. Its southern border forms part of the boundary between Kenya and Ethiopia. The area of the province totals approximately 40,000 square kilometers; it is the second smallest province in Ethiopia and probably one of the least developed. The province is mountainous with mountain ranges and valleys running roughly from north to south. In cross section, from east to west, there is the Rift Valley with lakes Abaya, Chamo and Stephanie and the large Gemu massif with heights up to 4,200 meters. Some of the most important rivers in the province are the Sagan, Waito and Omo. The Sagan and Waito rivers drain southwesterly into Lake Stephanie, while to the west, the Omo river drains in a southerly direction into Lake Rudolph in Kenya. The southern part of the province, namely Geleb, Hamer Bako and Gardula awrajas, contains extensive open savannah. The mountain ranges divide the province into different climatic regions and form separate water shed systems. The mountains also act as barriers to movement and communications between peoples.

The existing road system is extremely under-developed. The only all-weather roads are the road connecting Welamo-Bode to Arba Minch (approximately 119 kms.) and that portion of the USAID funded Arba Minch-Konso road which was recently completed in 1975 (approximately 35 kms.). All other roads are dry weather tracks and are in very poor condition. The poor condition of the road network is one of the chief reasons for the under-developed state of the province; particularly in the southern regions, and is the greatest cause of difficulty in the administration of drought relief and rehabilitation programs. Almost all drought relief commodities have to be air lifted into the remote population centers within the province during the wet season which extends from early April to September-October.

The average annual rainfall varies from 800 mm. in the southwest to over 2,000 mm. in the northwest. In the past few years the Gemu Gofa area has experienced a severe general drought, and it is thought that the pattern of rainfall is changing. There are two periods of rain, the "small rains" from April through June, and the "rain rains" which extend from June to September.

The vegetation of the northern part of the province is predominately grassland, while the remaining part is predominately tropical woodland and thorn bush. Most of the province, about 85%, is wasteland and fallow; 4% is forest, and a little over 7% is in agriculture.

The Central Statistics Office (CSO) shows the provincial population at 698,800 persons, of which only 5.3% or 36,800 are living in towns. With a yearly population growth of 2.5%, the population is expected to reach 851,417 in 1980.

The following depicts the rural population by awraja:

<u>Awraja</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>	<u>Percentage</u>
Gemu	134,800	128,400	263,200	38.5
Gofa	79,500	70,700	150,200	22.0
Gardule	90,300	79,600	169,900	24.8
Geleb and Hamer Bako	<u>--</u>	<u>--</u>	<u>100,500</u>	<u>14.7</u>
TOTAL	304,600	275,700	683,800	100.0

The Consolidated Food and Nutrition Information System (CFNIS) report of April 1975 estimated that 200,000 people in the province were in need of drought relief assistance. The report went on to state that 20,000 persons living in eight villages in Geleb and Hamer Bako awraja were in advanced stages of starvation. Other reports have indicated that the drought of 1973-74 accelerated the already serious social and economic problems existing in the province.

In a report published in 1973 by the Institute of Ethiopian Studies, a German anthropologist identified four major factors which negatively affect the natural resources and existing social order of the Geleb Hamer Bako region. These factors are: exhaustion of the soils, drought, disappearance of grasslands, and the spread of the Tsetse fly. This situation is further compounded by the build-up of inter-tribal tensions as a result of competition for grazing land. Several areas, traditionally used for arable cultivation or grazing, have had to be abandoned by their former users and now lie neglected, in a sort of "no-man's land" in disputed territories.

The human situation in this area will take time and considerable investment to improve. The RRC, with assistance from UNDP Settlement Project, has been at work since the latter part of 1975 in planning an integrated drought rehabilitation and rural development program for southern Gemu Gofa Province. This program would take advantage of existing farming activities along the major rivers, gradually expanding them, increasing production, improving access to the farm areas and abate diseases (Malaria, Tsetse fly) which have limited human and animal access to the river areas in the past. The program is phased over a three year period commencing in 1976-77 with activities scheduled along the Gato, Waito and Omo rivers. In the end, the livestock - agriculture, public health and community development program should directly affect as many as 50,000 persons and place three to four thousand new hectares of land under cultivation by the end of the project. At present, the RRC has worked out the organization of the program, budget (Eth.\$ 4.4 million), rough time table, staffing and equipment needs, and description of activities. In the program design,

however, there still remain a great deal of policy, technical and organization-management which needs to be worked out in detail before final approval of the program. It is for this reason that the entire program is not being considered for USAID funding at this time.

The southern Gemu Gofa drought road system sub-project has been designed to be an integral part of the overall drought rehabilitation and rural development program. The road is the initial phase of the program planned to provide all-weather access into this extremely remote area for relief commodities and to provide support for drought surveillance and rehabilitation activities in the area. It is anticipated the benefits of this initial phase will be realized by the population early on in the project, starting with the survey and clearing operations taking place in the first year, followed by basic mapping, survey, and social science activities for the agriculture and community development programs.

SECTION B

SOUTHERN GEMU GOFA DROUGHT AREA ROADS

PART II-B DETAILED DESCRIPTION OF PROJECT

II.-B. Detailed Description of Sub-Project Southern Gemu Gofa Drought Area Roads

The Southern Gemu Gofa Drought Access Roads project has been designed to be an integral part of the GOE's overall drought recovery and rehabilitation scheme for this drought stricken area. The roads construction sub-project is the first phase of this long-range program, providing all-weather access into this extremely remote and undeveloped region.

1. Role of AID

The role of AID will be to provide the Government of Ethiopia with a total of US \$4,000,000 for off-shore purchase of equipment (US \$2,100,000) and to cover a portion of the project's recurrent costs (US \$1,900,000).

2. Goal and Purpose

The roads activity is intended to prevent recurrence of future famine in southern Gemu Gofa as a result of drought and other natural causes by providing all-weather road access and improved government service to this drought affected area.

It is anticipated that the roads will allow a dramatic increase in the flow of heavy trucks and other vehicles into the area carrying goods and services. It is further anticipated that greater, quicker access to the area will permit more rapid and more effective execution of government recovery and rehabilitation programs and stimulate commercial activities in the area. Additionally, the improved communication will enable early detection of drought, famine and other disaster emergencies.

Experience with other drought penetration roads projects in the drought affected area of Ethiopia has shown that the benefits of these projects start to be realized early in the life of the sub-project, 24% of the project by the end of 24 months, increasing to 67% by the end of year three.

3. Outputs

Over the five year life of the sub-project, 230 kilometers of all-weather road will be constructed starting from a location at the Waito river crossing (see Map, Annex XXIII) and terminating at a point at the Omo river. (The rate of construction is estimated at approximately 3 km./month during initial labor intensive phase, increasing to 5-10 km./month as heavy equipment is introduced. Work stoppage should occur during the five to six month rainy season in May-October.

Construction work divides into four geographical sections: the Waito-Arbore section (approximately 60 km.) Arbore-Hamer Mt. section (approximately 45 km.), Turmi-Hamer Mt. section (approximately 50 km.), and the Turmi-Omo river section (approximately 75 km.)

The Waito-Arbore section is programmed to be completed within 30 months; the Arbore-Hamer Mt., Turmi-Hamer Mt. sections should both be completed by the end of 45 months; the last section, Turmi-Omo river, with all equipment from the other sections in support should be completed at the finish of the 60 month period.

Additional construction will include a Section Maintenance Camp which will be completed by the end of the 9th month of the sub-project at the Waito river crossing location; completion of a Section Camp at Demaka at the close of month 45; a ferry crossing at the Omo river completed by month 50; and completed construction of a Maintenance Camp in the vicinity of the Omo crossing by the close of the 60th month.

In the achievement of these "outputs", it is assumed that adequate funds will be available to complete construction; equipment to be procured locally will be on-hand; sufficient staff and labor force are available; the maintenance program will keep 70% of the equipment in operation at all times; off-shore purchased equipment arrives on schedule; and political stability allows the sub-project to proceed on schedule.

k. Inputs

a. USAID

USAID inputs to the activity total US \$4,000,000. Following the signing of the sub-project implementation letter and request by the GOE for a Letter of Commitment, USAID will issue such an amount not to exceed US \$2,100,000 for off-shore purchase of equipment and spare parts. The balance of US \$1,900,000 will be made available to the GOE according to the modified Fixed Amount Reimbursement (FAR) schedule detailed in the Finance Section of this project paper.

The FAR will commence as soon as the GOE has completed a weighted equivalent of one kilometer of road construction, and the road has been inspected and certified by USAID. According to the present construction schedule, this should occur toward the end of the first year of construction.

b. GOE

GOE inputs to the activity include off-shelf equipment and spare parts purchases, costs of one Section Camp, two Maintenance Camps,

hand tools and off-shelf equipment, the Omo ferry and a portion of the recurrent labor costs, staff salaries; recurrent POL and materials cost and ERA headquarters support, in an amount totaling US \$2,422,000.

(US \$)

GOE input	\$ 2,422,000
USAID input	<u>4,000,000</u>
TOTAL	\$ 6,422,000

Projected in time sequence, these inputs on a year by year basis occur as follows. Headquarters support, recurrent costs and salaries commence at the start of the activity and continue the full five years. Funding for the Section/Maintenance Camps at the Waito river crossing starts on or about the first year. Initial funding for the Demeka Section Camp is in year 2; the Omo ferry crossing is funded in year 4; and finally the last Maintenance Camp at the Omo location receives final funding in year 5.

SECTION B

SOUTHERN GEMU GOFA DROUGHT AREA ROADS

PART III-A SOCIO-ECONOMIC ANALYSIS

III.-A. Socio-Economic Analysis
Southern Gemu Gofa Drought Area Roads

Social Landscape

Southern Gemu Gofa, in particular Geleb and Hamer Bako and Gardula awrajas, is an area of many diverse people. More than eighteen different tribal groups from three basic ethnic groupings - Sudanic, Amotic and Lacustrine - comprise most of the area's 270,400 inhabitants. For the most part, these people are farmers and/or nomadic pastoralists living off the land and their animals. The majority of the farmers live in Gardula awraja cultivating the lowland valleys and the sides of the mountains. The semi-nomadic pastoralists mainly inhabit the southernmost part of the province in Geleb and Hamer Bako awrajas.

Relations among the tribal groups run hot and cold with violent hostilities frequently occurring among neighboring tribes. A great many of these people are armed with rifles and black market ammunition, which can be found, and which brings a good price. Since 1974 local police have reported more than 1,000 persons being killed in the Kibish-Kelem area in tribal disputes between the Geleb and Boume tribes. Battle scars are a mark of distinction among the male population and a man who has taken the life of another is considered more eligible in the eyes of the women of these tribes.

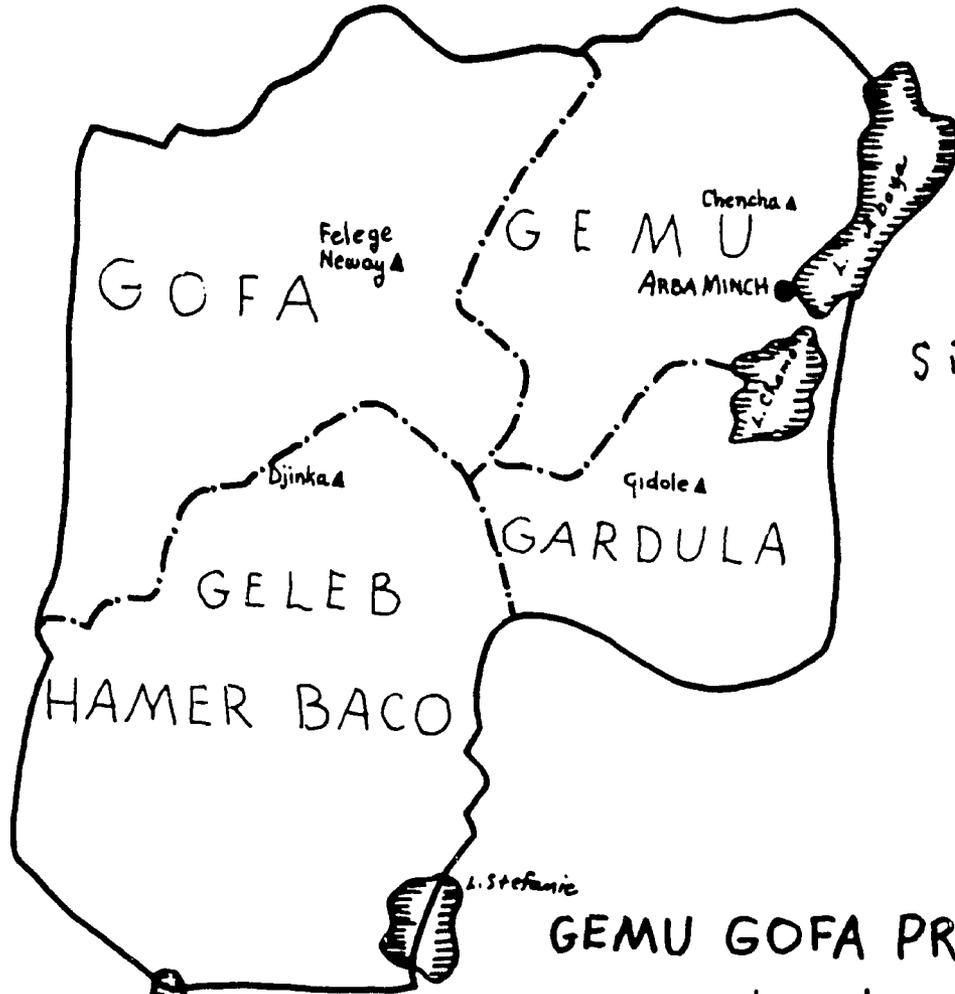
Isolation is a characteristic which can be applied to all of these tribes. Not only are the peoples physically separated from one another by mountains, rivers and other natural barriers, they are also separated by language, customs and fear. The semi-nomadic peoples of Geleb and Hamer Bako in particular are extremely primitive and backward, living for the most part a stone-age existence. These people live almost entirely outside the main stream of Ethiopian culture and civilization.

The economy of these people, unrefined as it is, is based on animals and farming. Animals are kept for the most part as a sign of wealth, rather than sold or used as food. For this reason, the animal population normally is quite high in proportion to the amount of grasslands available for pasture. Consequently, the animals are not well nourished and are susceptible to disease. The TseTse fly is also a growing menace to the animal population. In time of drought, the animals perish and with them goes one form of the people's nourishment: the blood which they drink. During these troubled times, raiders from neighboring tribes steal one another's animals as a mean of survival.

Among the semi-nomadic peoples, farming is practiced on a part-time basis, mainly by the women. The men and young boys usually stay with the animals in pasture. Farming is done along the river banks and on the sidea of the hills. Following the first rains or floods (high water)



Kafa



SUDAN

Sidamo

GEMU GOFA PROVINCE

Legend

- ARBA MINCH ● Province Capital
- Djinka ▲ Awraja Capital
- Awraja Boundary

KENYA

the people plant maize and/or sorghum and some vegetables. Among the Konsos and the other highland tribes, the ox is used to till the soil following the rain. In the river valleys, the more primitive peoples use a stick and chopping blade to prepare the soils and plant the seeds.

The yield from the farming of the semi-nomadic peoples is marginal with almost never a surplus. Customs of certain of these groups discourage the keeping of surplus crops, for it is customary to share half of whatever you have with others of the groups. The result is rather a hand to mouth sort of existence which discourages agriculture development.

Little is known about the religion of these tribal groups except that it is based largely on rites of passage - birth, manhood, marriage, death and after death - and social security. Polygamy is common, though it is unusual to find a man with more than two wives. Education is traditional, passed down from one generation to the next. There are almost no schools in the area.

Due to the low standard of farming, the sometimes poor health of the livestock, shortages of food, lack of variety in the diet, malnutrition is a chronic disease among the peoples of this area. Malaria is quite common and feared among the people as is tuberculosis. Infant mortality is high and so is the incidence of parasitic and bacterial diseases.

Malnutrition is one limiting factor with these people. The need to conserve energy restricts their ability to perform physical labor for prolonged periods of time. Some uninformed outsiders consider this a form of laziness, but it is, however, a means of survival and an example of human adjustment to environmental conditions.

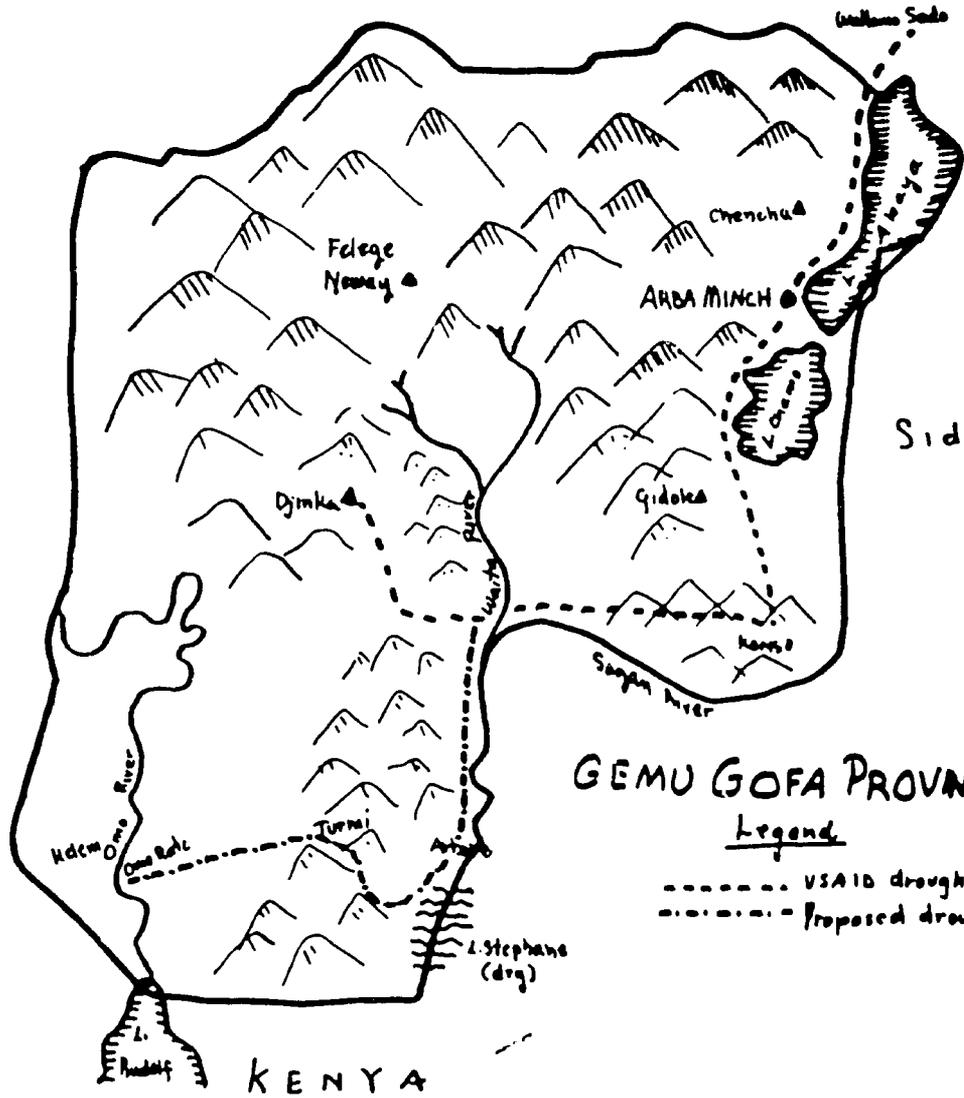
Social Organizational Structure

The basic social unit among the tribal groups of southern Gemu Gofa province is the family, averaging about six persons. Following the family in order of importance is the tribe or clan. Only to a limited extent (among the Konsos) does the town play a major role in the social organization of the people.

Tradition plays a major role in identifying and holding together the various social units for the most part civil law and administration add or subtract to the organization of the people, in particular the semi-nomadic peoples. Once again it is the isolation of these people which prevents government influence from becoming an integral part of their social system.



Kafa



Sidamo

SUDAN

GEMU GOFA PROVINCE

Legend

- USAID drought road
- Proposed drought road

KENYA

SOUTHERN GEMU GOFA TRIBAL POPULATION FIGURES

Baco Gazer Woreda

Shangama	14,984
Bio	11,163
Sido	7,260
Baco	8,698
Kure	5,065
Male	4,000
Total population	51,170

Mursi Woreda

Mursi	1,000
Bodi	2,500
Total population	3,500

Genakole Woreda

Bana	5,500
Tsamai	2,500
Total population	8,000

Hamer Woreda

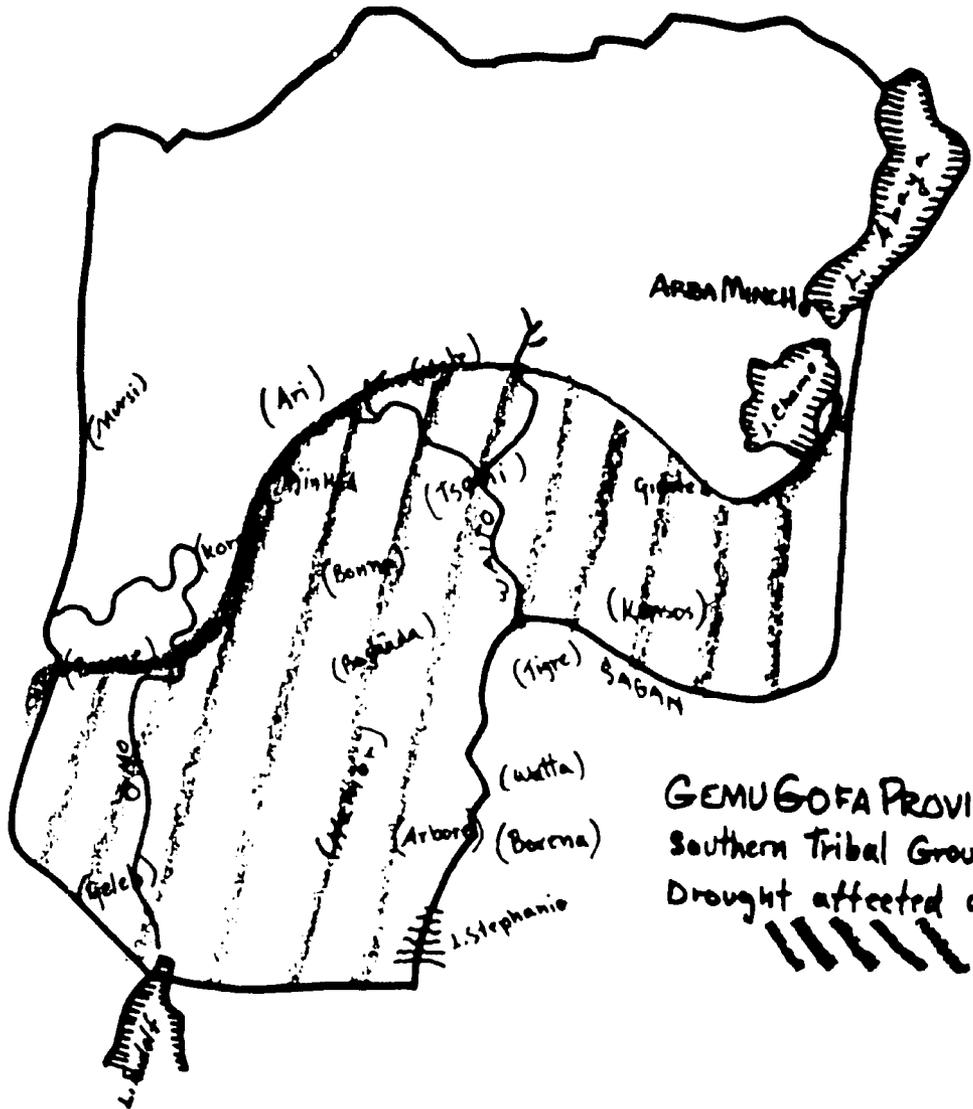
Hamer	11,000
Bashada	2,000
Arbore	1,000
Karo	1,000
Total population	15,000

Geleb Woreda

Geleb	20,000
Bume	3,000
Total population	23,000

Bekawle (Konso) Woreda

Konso	80,000
GRAND TOTAL	180,670



GEMU GOFA PROVINCE
Southern Tribal Groups
Drought affected area



Allocation of Time

The seasons of the year have an important influence on the activities in which the people involve themselves and the time which they allocate to them.

The year is divided into times for planting and times for harvesting for the farmers. Normally the rainy season allows for two harvests. Among the semi-nomadic peoples, this rule applies insofar as their farming efforts are concerned, and the coming and going of the rain dictates when and where the herdspeople must take the animals. Between harvests and plantings and migrations, there are slack times when the people can rest or devote their energies toward other pursuits.

Division of time within a day depends on the ongoing activities. First light means the start of work and dark means the end. In some areas, time must be allocated to movement from home to fields and return. Not all the farmers are able, for reasons of security and the malaria carrying mosquito, to live on or near the fields.

Periodically, migration to more fertile areas will require a certain amount of time to move and set up new shelters and reorganize the family routine.

Motivation

Of course, the greatest motivating force is survival. Since there is isolation and almost no cash economy established in these remote areas, material wealth outside the realm of animals and certain other items - weapons, jewelry, etc. - is of little importance at the present.

Certain social customs like sharing half of your wealth stifle any motivation encouraging saving or storing of food for example. One area where motivation can be inspired, however, is in health and nutrition. Most of these people appear to be concerned about the state of their health, taking advantage of any opportunity to avail themselves of medical care and food. For example, food-for-work projects, but only to the extent that they satisfy their immediate hunger, not to save, and walking for days to seek the aid of a motile health unit or clinic. Health and nutrition could prove to be strong motivating factors in working with these people.

Participation

The sub-project, which has been outlined in this paper, requires active and passive participation of the communities involved. Active participation would constitute local involvement in construction which is necessary to see the project through. For the most part, this

participation would be in the labor force of upwards of one thousand which will be required to clear land, move earth and other road building materials, construct bridges, drainage and other project related facilities and lay surfacing materials on the road beds. Passive participation would be demonstrated in various types of other support such as allowing the road to pass through tribal lands, relocating population, allowing community water resources to be used for project purposes and the like.

Though the percentage of the population that will actively participate in the project is relatively small in comparison to the total population, the benefit of their efforts for the population as a whole is great. The completed road will provide quick, more frequent, cheaper, access to the drought affected area allowing recovery activities to continue at an increasing tempo, as well as to allow surveillance of the area to happen with greater frequency, increasing chances of more effective government response in times of emergency and providing earlier detection of drought and other problems.

Other agriculture and community development activities with segments of the population will benefit from the improved accessibility as well.

Obstacles

There are numerous obstacles which are predictable. Most of these have been covered to the extent possible in the sections dealing with the social customs, traditions and under-developedness of the peoples of this area. With so many different languages spoken in the area, communication will also be a major problem. It is expected that in some areas where the population is semi-nomadic, there will be problems in recruiting these people into a labor force. However, the "motivating" factors of health and nutrition discussed above could prove to be the necessary elements in overcoming this difficulty. If not, there is the alternative of importing labor from other places within the area where the people are known for their willingness to work; the Konso people, for example. This importation of labor force might cause problems among the peoples, or it might serve to be a means of motivating local people to work when they see all the benefits going to others. There is little evidence that the peoples of this area are opposed to roads; on the contrary, all indications are that they welcome them, so there would not be reason for the people to stop the roads no matter who constructs them.

Communications Strategies

To start with, language is going to be a major communications problem in this area. The languages of the tribal groups in this area are scarcely known outside the region and have not yet been studied scientifically in much detail. In most tribes only a few men, if any, are known to speak Amharic or the language of another tribe. There are three basic language groups: Nilotic, Kushitic and another grouping which has not yet been classified.

The ideal strategy for communicating various aspects of the sub-project concept would involve finding individuals in the area capable of speaking one tribal tongue and understanding Amharic directly or through the use of an interpreter. This ideal approach may be able to be followed in certain areas where local police, missionaries, or other government personnel have already established a means of communication. These people have been in these areas for sometime and deal with the peoples on a regular basis. In areas where this is not possible, basic sign language and pictures would have to be used. In all likelihood, however, this situation would be rare.

Communications would flow to the community elders and/or village chief, Balambaras or whoever represents the group. The mode of communications would be the spoken word since written language is uncommon among most of these peoples. Visual aids and demonstrations would be necessary in the introduction of certain work skills.

The overall "message" to be transmitted would emphasize the social-economic importance of the roads sub-project to the people in terms of the opening of the area to trade, other forms of communication, government services to the area, employment, and so on. The economic and social logic of this sub-project is improved well being of the people, security and development.

Spread Effects

Improved communications in and access to an area is possibly one of the easiest to illustrate the benefits of spread effects for, because of the fundamental importance of these two elements. With such an undeveloped group of people, basic benefit of improved communications lies in the field of non-formal education, initially, for example, the introduction of the most fundamental tools - shovel, hoe, etc. - to the local practice of agriculture; and later perhaps more sophisticated farming techniques and increased productivity. Of course, in times of need, including the present, the transport of relief commodities is another fundamental benefit of improved communications.

Other aspects of the development process will benefit as well, including the body of social data of the peoples of the area and ability to make closer evaluation of the basic social and economic problems of the people. These things will not happen quickly, but over time improvement will follow.

Improved security in terms not only of physical protection, but in the area of health, will result from the improvement of the road and would lead towards the opening of new lands for cultivation and grazing.

The impact of the road could well be measured in terms of local benefits as soon as work begins and a way is cleared. The project itself will take 60 months to complete, however, transportation within the area will improve as soon as the right of ways are cleared, i.e., two years. The salary inputs of \$1.50 plus one kilo of flour a day will also have immediate social-economic effects. Once there is cash in the area, the traders will come via trucks and caravan to do business. There will also be a fairly large cash input available from management, equipment operators and other personnel related to the construction project.

Social Consequences and Benefits Incidence

The group this project is intended to help is a population of tribal peoples representing approximately 200,000 persons. It is intended to assist in a number of ways (covered above) and in a relatively short period of time. The project is one phase of an integrated rural development and drought rehabilitation program for southern Gemu Gofa.

In the long run, no one should be adversely affected by the project; quite the contrary. Though the sub-project itself affects only a relatively small percentage of the total population with direct benefits such as wages and food supplements, the indirect effects benefit a much greater proportion of the population.

In time the project will help in providing access of the population to the greater benefits derived from improved communications (covered above) allowing greater mobility to the population and opportunity to extend activities into new areas.

The completion of the project should provide changes with positive ramifications for the well being of the population. Of course, there is no guaranty of this, but experience with road projects in other similar areas of Ethiopia have proven positive for the population.

Economic Analysis

The selection of the actual route and standard of the road represent the major elements in the determination of the most effective design. Southern Gemu Gofa is probably the least accessible and most neglected area of Ethiopia. The general route selection criteria included: (1) maximizing access to the heartland of the recent drought area; (2) minimizing distance from the major population concentrations, and (3) providing a reasonable tie-in to the longer term planned road network for the area. The specific route chosen will be selected to minimize costs of construction and maintenance subject to the above general criteria.

The selection of road standard was determined by the rationale for constructing the road and probable traffic load in the medium term. Since the primary reason for constructing the road is to provide access to people who are periodically prone to food shortages and since this can occur at any time, a road built to all-weather standards is necessary. Since present traffic flow in the area is probably less than one vehicle per day and probably usage in the medium term will not exceed five vehicles per day, the lowest all-weather road standard was selected as the most cost effective.

Descriptive Benefits

Since the reason for constructing this road differs from the usual economic "development-of-the-area" one, and since studies of development potential are only now being conducted for southern Gemu Gofa, the usual type of benefit analysis cannot yet be applied. All benefits to the project are of a qualitative and intangible nature. These include: (1) the humanitarian benefits discussed in the economic analysis of the early warning system activity. 250,000 people reside in the area to be served by the road. These people probably have as little control over their lives and environment as virtually any peoples in the world. This combined with relative over-population in the area and a fragile ecology indicate that severe food problems will be a recurring phenomenon in the foreseeable future. (2) a reduction in transport costs to the area for relief activities. During 1975 as a result of the past drought, approximately 800 tons of grain had to be moved into the area, the largest portion of this by air. The all-weather road will not only eliminate the need for costly air transport but will reduce truck transport charges by perhaps 50%. (3) the beginnings of providing necessary infrastructure for the economic development of the area. As stated previously, the GOE has plans for comprehensive drought recovery and rural development along three prominent rivers in this area; obviously, better access than now exists will be essential prior to the development of these plans.

(4) better integration of the area with the rest of Ethiopia. Southern Gemu Gofa has received less governmental attention and has less infrastructure than any other part of Ethiopia and probably less outside contact. This has in turn contributed to the continuing extremely primitive condition of the people.

Summary

The southern Gemu Gofa drought road sub-project introduces an element of change into a deteriorated socio-economic situation which has evolved over the past years due to over-population of people and animals, depletion of rangelands, disease, changing climate and drought. The road sub-project affords the population an opportunity to participate in one aspect of a drought recovery program and to benefit from the advantages of improved communications in one of the country's most underdeveloped and isolated areas. The distribution of benefits should start relatively soon and be far reaching in their impact. The sub-project will assist the people and the government to exploit the numerous advantages of the area, such as: the rivers and lakes, climate and rainfall, fish and wildlife, soils and natural vegetation, minerals and, of course, the people themselves, and to improve upon, and add to, the main advantages which already exist in the area.

SECTION B

SOUTHERN GEMU GOFA DROUGHT AREA ROADS

PART III-B FINANCIAL ANALYSIS AND PLAN

III.-B. Financial Analysis and Plan

Southern Gemu Gofa Drought Area Roads

Summary

The total cost of the Gemu Gofa Road Project is estimated at \$6.4 million over five years. A summary of the funding is presented below:

	<u>Funding Summary</u>			
	(000 US\$)			
	<u>Foreign Exchange</u>	<u>Local Currency</u>	<u>Total</u>	<u>Percent</u>
AID	\$2,100	\$1,900	\$4,000	63%
GOE	-	2,422	2,422	37%
	\$2,100	\$4,322	\$6,422	100%

The "summary" cost estimate and Financial Plan, Table I below, shows the detail of source and use of total financing. AID will grant finance all of the foreign exchange costs for off-shore equipment procurement, including related spares and contingency/inflation factors, and a portion of recurrent local costs. The GOE will finance the purchase of off-shelf equipment and hand tools, inland transportation for off-shore equipment procurement, establishment of one section and two maintenance camps, the Omo river ferry, and a portion of recurrent costs. Contribution by AID and GOE amount to 63% and 37%, respectively, of the total project cost.

Detailed cost estimates for the various project components were prepared by REDSO's engineering staff and are presented in Attachment. XXIII

Appropriate inflation and contingency factors have been added for equipment purchases, mobilization and recurrent operating costs.

Use of Fixed Amount Reimbursement

Local currency disbursements under the AID grant will be made on the basis of the following modified Fixed Amount Reimbursement (FAR) method. Of the \$4,000,000 total AID contribution to this project, \$2,100,000 will be expended for off-shore procurement, using standard letter of commitment/letter of credit procedures. The balance of \$1,900,000 will be applied toward recurrent costs of road construction.

on a per kilometer completed basis; that is, for each of the 230 kilometers constructed, AID will reimburse the GOE fixed amount now estimated to be \$8,260* (equivalent to \$1,900,000 divided by 230). With total recurrent cost for road continuation estimated at 3,365,000, the contribution by AID and GOE for each kilometer completed will thus be \$8,260 (56%) and \$6,370 (44%), respectively, or a total of \$14,630.

Experience under the E-2 Activity has shown that the surfacing operation lags significantly behind the other construction steps. Therefore, to avoid the situation where the GOE is in a position of having to expend its funds for initial and intermediate road work while AID's disbursements are delayed until a given kilometer of road is actually one hundred percent completed, the following method, which assigns weights to categories of road work tasks, will be used to derive the equivalent of a completed kilometer for AID disbursement purposes:

1. The first category will include surveying, soils investigation, clearing and grubbing, earthwork and installation of drainage facilities. This category will be assigned a weight equivalent to 70% of the total construction work. Upon completion of all tasks in this category, the GOE will be eligible for reimbursement of 70% of the per kilometer cost agreed upon.
2. The second category will include only the surfacing of the road with select material. This category will be assigned a weight equivalent of 30% of the total construction activity, and when completed, the GOE will be eligible for reimbursement of 30% of per kilometer cost agreed upon.

Reimbursement requests will accompany a quarterly report detailing progress to date and following the category breakdown outlined above. In addition to supplying this information, each report will also contain an ERA certification to the effect that:

1. the information contained in the report is correct;
2. the request for reimbursement is in addition to payments already made for work completed;
3. any overpayment will be reimbursed to AID.

Upon receipt of the request for reimbursement, the AID representative will inspect and certify that the works completed are constructed in accordance with the AID/GOE agreed standards. After certification, payment will be processed.

* This amount is subject to modification when the survey work is completed and the exact road length is established.

It should be noted that the actual length of the road financed under this project is subject to adjustment pending completion of the actual survey to yield exact distances. The FAR amount then will be subject to review and modification by mutual agreement between GOE and USAID. However, the AID contribution will be limited to US\$ 4.0 million. The modification will be recorded by means of an implementation letter signed by both parties.

Recurrent Budget Analysis of Implementating Agency

The total cost of the 5-year project is estimated at \$6,422,000 of which \$4,000,000 will be financed with AID grant funds and \$2,422,000 (Eth.\$4,974,800) financed by the GOE.

Recurrent budget requirements following completion of the activity will for the most part be confined to road maintenance operations. The standard ERA factor for two maintenance operations per year on Class B roads is Eth.\$1500 per kilometer. Since the volume of traffic will not warrant two such operations and since maintenance operations will rely heavily on local labor, it is estimated the recurrent budget for this will not exceed Eth.\$150,000. In FY 1976 the budget for ERA maintenance of road and premises amounted to Eth.\$27.3 million; this represents an increase of 37% over the Eth.\$19.9 million budget in FY 1974. Clearly the increased requirements for the current road activity are minimal relative to the increase in the total budget for maintenance.

Applicability - Section 110(b), FAA

It is estimated, as shown in Part IV, B, Implementation Arrangements, that AID disbursement could occur over a 52-month period, beginning about 12 months after the date of the Grant Agreement. The nature of the essential AID inputs to the project, and the practical constraints to availability and scheduling, are such that it is not possible to provide financing for these inputs in a realistic and rational manner in less than the estimated 52-month disbursement period. This arises primarily from two sets of factors. First, new construction equipment, to be procured in the U.S. in accord with AID source/origin policies, is essential for the work and, as explained in the Implementation Section and the PPT diagram, it will require approximately 21-month lead time to get a significant portion of this equipment to the job site. Second, road construction in the isolated location and rough terrain of Gemu Gofa is so inherently difficult for a variety of reasons, as shown in the Technical Analysis (labor, spare parts, maintenance, general supply, etc.), that completion of the work will require an estimated 40 months after the U.S. equipment is on site.

Shortly after signing the Grant Agreement, the ERA will begin work on the labor intensive first category of construction work. Reimbursement at the estimated rate of 65% of the total completed kilometer cost should begin on a small scale about 8 months following the Grant Agreement. Significant disbursements under the L/C-L/Comm. procedure for the procurement of U.S. equipment should follow between 15 and 20 months after the Grant Agreement when equipment is delivered for shipping from U.S. ports. The use of this equipment on the job, starting 21 to 23 months after the Grant Agreement will result in substantially increased FAR payments for construction which should be completed 60 months after the Grant Agreement.

Section 110(b) of the Foreign Assistance Act, which has been interpreted as applying under certain circumstances a 36-month limitation on the disbursement period for grant funded capital projects, should not preclude the estimated 52 month disbursement period for this project. The intent and purpose of Section 110(b) was to help in providing AID with new directions, to encourage people-oriented projects and to discourage the financing of major capital projects, e.g., great highways and dams. This minor drought relief and access road is a people-oriented project and is not a major construction project. A determination based on the spirit and intent of the Section 110(b) can only be that it is not applicable to this project. Alternatively, if the AID definition of a capital project, in pertinent part ".....the construction, expansion, equipment or alteration of a physical facility.....financed by AID dollar assistance of not less than \$100,000.....", requires a finding that Section 110(b) is technically applicable to this project, then the basic inconsistency between the purpose of Section 110(b) and its application to this project should provide adequate justification for the Congress to not object to a relaxation of its strict application. Additionally, USAID/Ethiopia has determined that supplemental financing for the road is not available from sources within Ethiopia or from other donors.

Conclusion

Based on the analysis contained herein, it is concluded that the financial plan is adequate and firm and that the GOE's ability to provide their share of project inputs as well as properly maintain the completed road is reasonably assured.

TABLE I

SUMMARY COST ESTIMATE AND FINANCIAL PLAN

(GEMU GOFA DROUGHT ROADS)

(000 US \$)

SOURCE	A I D			G O E			FX	LC	TOTAL
	FX	LC	TOTAL	FX	LC	TOTAL			
1. Equipment	1,496	-	1,496	-	153	153	1,496	153	1,649
2. Spares	224	-	224	-	-	-	224	-	224
3. Inland Transport	-	-	-	-	50	50	-	50	50
4. Hand Tools	-	-	-	-	37	37	-	37	37
5. Maint. Camps	-	-	-	-	120	120	-	120	120
6. Section Camp	-	-	-	-	101	101	-	101	101
7. Omo Ferry	-	-	-	-	100	100	-	100	100
8. Recurrent Costs	-	1,900	1,900	-	1,833	1,833	-	3,733	3,733
9. Inflation	206	**	206	-	*	-	206	-	206
10. Contingency	174	-	174	-	28	28	174	28	202
11. Total	2,100	1,900	4,000	-	2,422	2,422	2,100	4,322	6,422
12. Percent	-	-	63%	-	-	37%	-	-	100%

* See text discussion of FAR procedure for explanation of AID/GOE contribution.

** Inflation factor included in recurrent costs.

TABLE II

COSTING OF PROJECT OUTPUTS/INPUTS (DROUGHT ROADS)

(000 US \$)

<u>PROJECT INPUTS</u>	<u>PROJECT OUTPUTS</u>				<u>TOTAL</u>
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	
	<u>Road</u>	<u>Section</u>	<u>Maint.</u>	<u>Omo</u>	
<u>A I D</u>	<u>230 km</u>	<u>Camp</u>	<u>Camp</u>	<u>Ferry</u>	
1. Equipment	2,100.0				2,100.0
2. Recurrent Costs	1,900.0				1,900.0
	4,000.0				
<u>G O E</u>					
1. Equipment	243.0	67.5	101.5	75.0	487.0
2. Construction		44.5	32.5	25.0	102.0
3. Recurrent Costs	1,465.0	164.0	204.0		1,833.0
	1,708.0	276.0	338.0	100.0	2,422.0
TOTAL	5,708.0	276.0	338.0	100.0	6,422.0

TABLE III

SCHEDULE OF ACCRUED EXPENDITURES (DROUGHT ROADS)

(000 US \$)

	YEAR	YEAR	YEAR	YEAR	YEAR	
<u>A I D</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>TOTAL</u>
Equipment	2,100.0	-	-	-	-	2,100.0
Recurrent Costs (roads <u>1/</u>)	206.6	272.6	545.2	627.8	274.8	1,900.0
(Equivalent kms)	<u>(25)</u>	<u>(33)</u>	<u>(65)</u>	<u>(76)</u>	<u>(30)</u>	<u>(230)</u>
TOTAL AID	2,306.6	272.6	545.2	627.8	247.8	
<u>G O E</u>						
Equipment						
Offshelf	153.0					153.0
Hand tools	40.0					40.0
Inland transport		50.0				50.0
Section camp		38.0	38.0	36.0		112.0
Maint. camps						
# 1	67.0					67.0
# 2				15.0	52.0	67.0
Ferry				100.0		100.0
Recurrent Costs (roads <u>2/</u>)	235.7	191.1	445.9	439.5	152.8	1,465.0
(Equivalent kms)	<u>(37)</u>	<u>(30)</u>	<u>(70)</u>	<u>(69)</u>	<u>(24)</u>	<u>(230)</u>
Camps	<u>10.5</u>	<u>31.5</u>	<u>70.1</u>	<u>101.3</u>	<u>154.6</u>	<u>368.0</u>
TOTAL GOE	506.2	310.6	554.0	691.8	359.4	2,422.0
TOTAL AID & GOE	2,812.8	583.2	1,099.2	1,319.6	607.2	6,422.0

Footnotes for Table III

1. Equivalency kilometers for USAID FAR is in body of text, P.
2. GOE recurring costs were based on an equivalency kilometer basis which took each stage of construction into account, using a weighting system of 5% for surveying, 15% for clearing and grubbing, 35% for earthworks, 15% for surfacing the kilometer equivalents were derived. Assuming a GOE contribution of (6370/km) (1,465,000 / 230 kms) the recurring costs for 1 through 5 were estimated.

ATTACHMENT 1

EXPECTED ROADWORK COMPLETED

	<u>YEAR 1</u>	<u>YEAR 2</u>	<u>YEAR 3</u>	<u>YEAR 4</u>	<u>YEAR 5</u>
Survey 5%	60 km (75 previously completed)	95 km	-	-	-
Clear 15	50 km	10 km	55 km	(11.25) 75 km	-
Earth 35	40 km	20 km	85 km	80 km (28)	(1.75) 5 km
Drain 15	30 km	30 km	70 km	85 km	15 km
Surf. 30	15 km	40 km	55 km	55 km	65 km
<hr/>					
U.S. equiv.	25 km	33 km	66 km	76 km	30 km
Cost at 8260/km	206,600	272,600	545,200	627,800	247,800
<hr/>					
GOE equiv.	37 km	30 km	70 km	69 km	24 km
6370 km	235,700	191,000	445,900	439,500	152,800

See Table III - Financial analysis for explanation of kilometer equivalency.

SECTION B

SOUTHERN GEMU GOFA DROUGHT AREA ROADS

PART III-C TECHNICAL ANALYSIS

III.-C. Technical Analysis
Southern Gemu Gofa Drought Area Roads

Engineering Requirements

1. Introduction

The program proposed for AID grant financing is the construction of approximately 230 kilometers of rural access roads built to a designated modified Class B standard.

This project is located in southwest Ethiopia in the southern area of Gemu Gofa province (see map, Annex XXIII) within the provincial awraja (awrajas are similar to county type administrative units) of Geleb and Hamer Bako.

This project is an extension of an ongoing access road project started in 1975 under the AID grant financed Ethiopia Recovery and Rehabilitation Program (Drought Recovery, Grant 663-F-601). Under this 1975 program, Activity #-2 provided US\$ 4.56 million for access road construction at four specific locations in southern Ethiopia. One of these four locations was in Gemu Gofa province, starting at the provincial capital of Arba Minch and running 185 kilometers south and west to Konso and Jinka. This project is under construction at this time, being approximately 40 percent complete.

This proposed project will start west of Waito river crossing* on the line at the present construction site and run south and west through Arbore-Turmi and terminating at Kelem.

This route requires about 20 stream crossings as well as the Omo river crossing at Omo Rate.

The construction of this road and the necessary drainage facilities is proposed to be accomplished by means of mixing labor intensive methods and construction equipment. The exact number of laborers will be determined in the field after mobilization is completed.

In the initial stages of this design, efforts were concentrated on using more labor and less equipment. However, investigation revealed that the villagers in the Turmi area are nomadic and the male members of the family do not work. Therefore, the equipment list was modified and the units on the list were increased

* The Waito river crosses the road alignment between Konso and Jinka. This section of the road is presently under construction by ERA under Activity E-2 funding. The ERA has surveyed for a 25-meter bailey bridge to be installed at this location.

For the purpose of starting construction in November of 1976, GOE will purchase hand tools and minimum equipment required for mobilization as a labor intensive construction unit (see Annex XXIII). These units will be purchased as off-shelf items.

This program is intended to complement the present ongoing R&R program (Activity E-2) and further be incorporated into a forthcoming AID-financed Rural Access Road Program (proposed under FY 77 funding). The construction procedures outlined here follow the ongoing Activity E-2 practice.

2. Road and Drainage Standards

The road improvement program basically consists of constructing to Rural Access Road Standard, Modified Class B (see Annex XXIII):

- a. Surfacing: Select pit run granular surfacing material placed to a minimum depth of 15-cm. Compacted thickness of a four (4) meter surface width. Material to be placed on those sections of road will provide a 75 percent (9-month) yearly road usability.
- b. Right of Way and Road Bed: A 30-meter width ROW and a six (6) meter formation road bed from shoulder break to shoulder break.
- c. Clearing Width: To vary from 14 to 20 meters.
- d. Shoulder Width: One meter (1).
- e. Roadway Cross Slopes: 3 to 4 percent.
- f. Gradient: 12 percent with short sections (maximum 100 meters) of 15 percent.
- g. Curvature: 10 meter minimum.
- h. Modifications in Road Bed Formation: Mountainous terrain may require reduction in road bed formation widths to four meter sections. Reductions to be approved by the Rural Roads Division of ERA.
- i. Drainage: Culverts will be of reinforced culvert pipes to be placed as required, where extreme gully crossings are indicated.
- j. Fords: The majority of stream crossings are to be of simple stone bed fords with stone-placed approaches and footing (headers) placed on up-stream sides. The selection of the type of crossing will be the responsibility of the Site Engineer.

k. River Crossings: It is the intention of ERA to provide a ten-ton capacity pontoon ferry crossing over the Omo River and one bailey bridge over the Waito River.

The above standards conform to those standards in effect on the present AID - financed Rural Roads Program (Activity E-2) as developed and adopted by the Rural Roads Division of the ERA for rural access roads construction, modified Class B. The standards are not related to ADT classification, as projected ADT for this system and class of roads would be an ADT-5. Standards conform to a staged development road network program.

3. Construction Methods

It is proposed that construction of these roads be accomplished by a mixture of labor intensive and equipment type operations; where available, labor will be utilized on this project. This follows the procedures now being applied under ongoing Activity E-2.

The work is expected to be performed in the following manner:

- a. Clearance of ROW; hand labor.
- b. Formation of Road Beds: hand labor, equipment input where rock formations prevent the efficient use of labor.
- c. Ditch and Back Slope Formations: hand labor, equipment use in rock formations.
- d. Placement of Cross Drainage Culverts and Construction of Stone Fords: hand labor, materials to be delivered by mechanical means and trucks.
- e. Access Roads and Clearing of Select Material Borrow Pits: mixture of hand labor and equipment (dozer).
- f. Stockpiling Surfacing Material at Pit Sites: equipment (dozers).
- g. Loading and Hauling of Surfacing Material: planned equipment loading and hauling by trucks.
- h. Spreading and Compaction of Surfacing Material: hand labor spreading and mechanical compaction.
- i. Final Dressing of Surfacing Material: equipment (grader).

4. Surfacing Material

The ERA Materials Testing Division will provide personnel for the Rural Roads Division to conduct a soils survey and investigate the availability and source of select material for the surfacing of this road. Soil investigation for a section of the road from Turmi to Kelem is already completed. These activities will start in the beginning stages of the implementation of this project.

The field reconnaissance of the route by an AID and ERA engineer indicated, from surface evidence, that select material for surfacing of the first 60 kilometers (Waito river to Arbore) will not be readily available. Therefore, the surfacing material will require trucking with hauls of 10-20 kilometers and will not commence at the early stages of the works; the exact location of the pits and the distance of hauls will be determined after the soils investigation is completed. The surfacing material is more than sufficiently available for a section of the road (about 10 kilometers) to be constructed in the mountainous area. The select material for surfacing the remainder of the road project is not expected to be a major problem.

5. Drainage Placement

Cross drainage and culvert placements will be performed by hand labor methods.

The route reconnaissance shows that about 150 locations of reinforced concrete piping will be placed. It is planned that the pipes will be manufactured at the section camp to be established under this project. This follows the normal ERA procedures of casting pipe at strategically located construction sites.

It is estimated that about 20 masonry fords will be constructed on this route; this again represents hand labor construction.

6. Omo River Ferry Crossing

The RRC has plans to install a ten-ton capacity simple pontoon type ferry for crossing the Omo river. The Commission is presently in the process of preparing final plans and arranging method of payment. Submission of final plans for the ferry crossing, satisfactory to AID, will be a condition precedent to initial disbursement under the proposed grant.

7. Bailey Bridge on the Waito River

The ERA has already completed a survey for the placement of a bailey bridge at the Waito river crossing, just before the beginning of this proposed road project. This bridge will be installed in conjunction with the ongoing E-2 Activity. Funds for its acquisition and installation have already been budgeted by the GOE.

8. Route Selection

A field reconnaissance of the proposed route from the start at the Waito river junction to the terminal point at Kelem was accomplished. The ERA has already completed a field route survey of the Turmi to Kelem section of this route. Surveying the rest of the route for the proposed road, from the Waito river to Turmi, will commence immediately after the end of the rainy season.

The route will follow a previously established track to Kelem termination with some changes in the alignment as deemed necessary.

9. Engineering Requirements

It is proposed, following the practice of Activity E-2, that the engineering requirements for the implementation of construction will consist of the following:

a. completion of the route survey and establishment of a center-line by ERA survey teams.

b. completion of the material survey and location of the select materials borrow pits by the ERA Materials Testing Division and assisted by the project-assigned personnel, from Waito to Turmi.

c. construction work and quality control (i.e. compaction drainage installations, river crossings, etc.) will be accomplished by the construction supervisory personnel, assigned by the Rural Roads Division of the project.

Technical Feasibility

1. Appropriateness of Technology

This project is designed along the same technical format as that being applied for the present ongoing Activity E-2. The project is designed as a labor intensive operation with a mixture of equipment to allow for the efficient application of labor intensive operations. This technology is considered to be best for the needs of the country in view of some labor constraints now evident in implementing this type of project.

The selected route follows an existing track. The alignment passes through least-difficult terrain connecting the Waito river area to Arbore, Turmi and Kelem.

b. Completion of the material survey and location of the select materials borrow pits by the ERA Materials Testing Division and assisted by the project-assigned personnel, from Waito to Turmi.

c. Construction work and quality control (i.e. compaction drainage installations, river crossings, etc.) will be accompanied by the construction supervisory personnel, assigned by the Rural Roads Division to the project.

Technical Feasibility

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This selected route follows an existing track. The alignment passes through least-difficult terrain connecting the Waito River area to Arbore, Turmi and Kelem.

The four road sections now under construction under Activity E-2 are being constructed in a satisfactory manner but lag behind schedule; delays are particularly evident in the gravel surfacing operations. The technology of the construction of these four sections reflects a high labor intensive operation, except for surfacing which requires loading and hauling by mechanical means. The problems of equipment maintenance, repair and operation of the truck hauling units related to the gravel surfacing work has caused the operation to be behind schedule.

ERA is planning to procure a limited amount of equipment and hand tools to be used by laborers for this project (see Annex XXIII). This procurement is considered to be the minimal amount necessary to support the labor intensive work to obtain maximum effectiveness and production for the job conditions. The financial support to procure this initial equipment will be provided by GOE as local cost contribution to the project.

2. Equipment Requirements

a. Equipment

The equipment requirements for this project were based on:

- i) the present ongoing Activity E-2 and the problems of equipment support;
- ii) the geographic conditions of the project location; iii) the implementation of the project within the time frame; iv) the labor equipment mix, and
- v) the availability of local labor and related social/cultural problems.

It is intended that the ERA procurement division, with AID approval, will be responsible for carrying out procurement of off-shore equipment, listed in Annex XXIII. Procurement will be in accordance with relevant GOE regulations and AID Handbook 11 - Country Contracting.

Capital cost to the project will not be included in the establishment of the cost per kilometer of construction. A modified Fixed Amount Reimbursement (FAR) is to be the basis of AID local cost funding for this project.

b. Equipment Maintenance and Spare Parts Support

Equipment maintenance and spare parts support has been a major problem in the implementation of ongoing Activity E-2, especially with the almost fully mechanized operation of gravel surfacing.

GOE/USAID/REDSO, being aware of this problem, conducted an evaluation of the recently completed AID-financed project referred to as the Highway Equipment Repair Facilities (HERF), AID Loan No. 663-H-017, 017A.

The purpose of this evaluation was to determine the present capability of the ERA and its ability to support additional equipment financed under the ongoing Activity E-2 project, this proposed project, and the forthcoming AID-financed Rural Access Roads Project. Conclusions reached show that the ERA is faced with two major constraints: i) lack of an adequate number of technically trained equipment support personnel (to be addressed in the manpower section of this paper), and ii) lack of an efficient system to procure and distribute spare parts.

The project will be supported, for major equipment repairs, by the ERA District Shop located at Shashamane. This shop was part of the above mentioned evaluation and proved to have the capacity to support this project. However, this District Shop is located 300-km. from the project site, posing a problem in timely and efficient support functions.

The second stage support of equipment for this project is the ERA "section camp" located at Arba Minch. This section camp is presently supporting the Arba Minch-Konso-Jinka AID-funded project under Activity E-2. This section camp is located 100-km from the beginning of this proposed project.

In order to satisfactorily provide timely support to the proposed equipment and concurrently support the labor intensive operations, it is proposed that this project will include construction of a permanent "section camp" at Kimeka located at approximately the half-way point of the project. This section camp will have repair facilities to provide first and second echelon levels of equipment maintenance, with third and fourth echelon maintenance support being provided by the ERA District Shop at Shashamane.

A secondary and subsequent function of this section camp will be to provide a base of operations for road maintenance for both this project and the ongoing Activity E-2 project. It is estimated that the establishment of this section camp will require from 6 to 12 months' time with expected completion prior to the arrival of the major portion of equipment.

The spare parts issue presents a more difficult ERA system, Central Warehouse and Procurement Branch Operations. This has proved unsatisfactory in support of Activity E-2.

The cause of this unsatisfactory support, which is the responsibility of ERA, appears to be: i) the lack of availability of off-shelf spare parts in Ethiopia, ii) insufficient number of technically skilled personnel at the Central Warehouse, iii) lack of specific follow-up system of assignments, and iv) the long distances from the Central Warehouse to the project sites and the resulting communications difficulties. Therefore, it is proposed that this project have one spare parts expeditor/mechanic assigned to this project from the ERA. The expeditor will work under the RRD, for the 60 months' life of the project, to expedite the acquisition of required spare parts and to work directly between the project and the ERA Central Warehouse and Procurement Branch. It is anticipated that the individual selected for this purpose will be a highly qualified mechanic. He will be required to spend 3/4 of his time in Addis Ababa expediting the acquisition of spare parts and 1/4 of this time in field travel, delivery of parts, helping repair units and generally becoming acquainted with the needs of the field operations. This individual will be given a petty cash account with an authorized ceiling to purchase necessary minor spares, when not available in the Central Warehouse, directly from local sources. During the initial stages, prior to the arrival of heavy construction equipment, this individual will help expedite procurement of labor construction hand tools and minimum equipment needed for mobilizing the labor camp. He will also expedite the clearance and delivery of equipment to project sites when equipment arrives at the Ethiopian port.

In order to assure that adequate spare parts will be made available for this project, ERA/RDD concurrence that a spare parts expeditor will be assigned to this project will be included in the project agreement.

It is intended that fast-moving spare parts, equal to 15 percent of equipment value CIF port of entry, will be purchased with offshore equipment. Provision of additional spare parts will be the responsibility of ERA, using established procedures, i.e. off shelf purchases through local dealers, or directly from manufacturers under the ERA bulk ordering system. The additional spare parts required for the life of the project is estimated to be about 35 percent of the equipment cost.

3. Road Maintenance

The design standards and construction methodology applicable to this road project will require a closely controlled and adequately financed annual road maintenance program.

There are some constraints evident in the establishment of such a program for this project. At the present time, the GOE is in a reorganization process affecting the future of the Rural Roads Division. The Rural Roads Division is to be established as a permanent body with the responsibility of construction and maintenance of rural roads of the class and standard being built under this project. This reorganization is to be completed within the next six months. It is the intent that the maintenance of roads constructed under this project will remain a responsibility of the Rural Roads Organization.

Under the FAR system, this project is designed to include the cost of maintaining this road during the five-year life of the project.

It is planned that road maintenance operations will be based on labor intensive methods, with minimum equipment, starting upon the completion of the first 50-km. section of the roadway. This is estimated to start at month 22 of the project life. It is then intended that following completion of the project, a maintenance system will have been devised and be in operation for some three years. Two maintenance camps are designed under this project, one to be located at Waito River crossing and the other at Kelem, with one section camp support at Dimeka (midway).

Thus, the total length of this road will be well covered for maintenance purposes.

It is planned that the Waito River maintenance camp will also maintain those sections of the road being built under E-2 which is in the immediate geographical area of this project (50-km radius). The second maintenance camp was selected to be located at Kelem, to provide services to additional roads proposed to be built by ERA from Kelem in a northerly direction.

It is intended that maintenance funding will then be allocated by GOE after the life of this project for the above defined maintenance requirements.

4. Manpower Analysis

a. ERA Rural Roads Division Personnel

A recently completed evaluation of AID-financed project 663-H-017 and 017-A - HERF - surfaced a side issue that requires addressing. The issue raised is the lack of technically trained equipment support personnel, i.e. mechanics, mechanic helpers, electricians, welders, etc.

In order to overcome the shortage of personnel in these categories, the Rural Roads Division of ERA has already placed a notice in the local newspaper intending to hire personnel with basic qualifications to be trained for vacant positions. The categories and number of personnel to be hired are as follows:

Construction Foremen, grade II	15 persons
Construction Foremen, grade I	20 persons
Engineering Aides, grade II	10 persons
Construction Superintendents	10 persons
Accounts Clerk II	15 persons
Accounts Clerk I	5 persons
Assistant Clerk I	20 persons
Clerical Aides	40 persons
Store Clerks	10 persons
Equipment Electricians	10 persons
Welders	10 persons
Mechanics, III	5 persons
Mechanics, II	10 persons
Mechanics, I	20 persons

The above individuals will be required to have the basic educational and training background. Examinations will be given and individuals selected. Upon completion of the selection process, the candidates will be sent to Alem Gana Training Center for a three-month accelerated training course and each candidate will be trained in his specific field. The training is scheduled for May 15 with completion expected before the end of August 1976. Upon completion of this training program, the newly trained candidates will be assigned to work on various activities under a senior and more experienced Rural Roads Division staff. This approach will allow reassignment to higher responsibilities of some of the experienced staff. USAID/REDSO believe that this approach should reduce the manpower shortage problem.

b. Labor for Construction

The subject of availability of labor for construction, the interest and behavior of villagers towards work along the road alignment was studied (behavior of these groups is known to the Rural Roads Division). It was concluded that local labor will be used where available, along the road alignment. At areas where labor is not available or unproductive, labor will be imported from adjacent villages.

The availability of labor in the Waito River area, which is the starting point of the proposed project, is not a problem as the people of this area are known for their durability and hard work (terracing the mountain side for planting maize, etc.). The project design indicates that a labor intensive construction project will begin at this location about November of 1976. The labor for this area will be mostly from Konsol and Arbore area.

The availability of labor in the Turmi area seems to be problematic as the people in this area are known to be nomadic and the male members of the families apparently do not work. Some labor for this area will be imported from Arbore and Konsol areas. This procedure, of course, creates housing and transportation problems which have been considered in the project design.

5. Reasonableness of Cost Estimate

Cost estimates used for equipment are based on prices of equipment for recent (mid-1975) AID/IBRD financed projects for Ethiopia and adjacent countries in the Eastern Africa area.

Cost estimates for GOE/ERA inputs for labor, POL, construction material and related items are based on prices furnished by ERA based on their actual experiences with the on-going E-2 activities.

A price escalation factor of 1.0 percent per month and a contingency factor of about 10 percent have been added to basic cost estimates for equipment and spares.

6. Environmental Impact

An assessment of the potential environmental impact of this program indicates that no significant problem area exist or are likely to develop. See the Environmental Annex for details.

7. Summary Conclusion

The Engineering Analysis of this project is prepared by REDSO/USAID and GOE/ERA Rural Roads Division. The Technical Analysis contained herein is determined to be consistent with sound road engineering principles applicable to the type and method of construction described herein.

Section 611(a)(i) of the FAA related to firm cost estimates is considered to have been satisfied. Due to the nature of the construction it will not be necessary to develop engineering plans for this project. Typical cross sections for the road improvements have been established and agreed upon by REDSO/USAID/GOE along with drainage standards.

Section 611(e) related to the effective maintenance of the improved road facility is determined to be satisfied with regard to the capacity of the Rural Roads Division to maintain the proposed roads during the construction and continue maintenance operation after completion of the construction activities. ERA has provided assurance to continue financing and maintaining the two road maintenance camps and to perform the follow-up maintenance work. The assurances will be included as part of the Grant Agreement.

SECTION B

SOUTHERN GEMU GOFA DROUGHT AREA ROADS

PART IV - IMPLEMENTATION ARRANGEMENTS

PART IV - A. ADMINISTRATIVE ARRANGEMENTS

A. Administrative Arrangements

1. Recipient

a. Implementation Responsibility

The implementation procedure to be used for this activity, except for the modifications noted below, will be basically the same as those used for activity E-2 rural roads construction. The responsibility for the implementation of this activity is with the Rural Roads Division of the Ethiopian Roads Authority (ERA/RRD) with the cooperation of the Relief and Rehabilitation Commission. This relationship has been in effect for more than two years and the respective roles of the agencies in this undertaking are fully understood by both.

b. Management

- (1) RRC: The RRC is responsible for the planning and implementation of drought relief and rehabilitation program throughout Ethiopia. It is responsible for securing and coordinating donor assistance to the drought problem. The role of the RRC with regard to the Southern Gemu Gofa drought roads activity will be one of coordination between the donor and the Ethiopian Road Authority. While request for reimbursement will continue to be initiated by ERA and submitted to AID through RRC, disbursement by AID will be made directly to ERA.

Reports will be identified in the implementation documents (financial, progress, evaluation) will pass directly from ERA to USAID with copies to the RRC. Matters relating to overall relief and rehabilitation policy and, or changes in the implementation plans will be dealt with jointly by the RRC, ERA and USAID through formal procedures which will be outlined in the Activity Implementation Letter.

- (2) ERA/RRD: Overall administration of the activity is the responsibility of the Rural Roads Coordinator, Chief of Rural Roads Division, under the guidance of the General Manager of ERA. RRD has the responsibility for the survey, design, and construction of the 230 kilometers of all-weather, modified class B, road to be built in southern Gemu Gofa province. In the past two years RRD has had considerable experience in the construction of drought roads in Bale, Gemu Gofa, Sidamo provinces. Additionally, RRD has had experience in the administration and management of USAID funded road activities. RRD has field offices in six project locations in the provinces mentioned above, with a large work force which includes professional engineers, construction superintendents, equipment operators, mechanics, masons, carpenters and other skilled and semi-skilled personnel.

Where manpower deficiencies are identified RRD will call upon other divisions of ERA for assistance in the provision of skilled manpower, planning and programming, fiscal management, technical assistance, and equipment support.

- (3) USAID: USAID will designate a project officer for monitoring of AID involvement in the activity and for the coordination of AID inputs.
- (4) REDSO: REDSO will continue providing technical assistance to backstop and monitor these activities.

PART IV - B. IMPLEMENTATION PLAN

B. Implementation Plan

1. Mobilization

Virtually all equipment which could have been spared by ERA for the Gemu Gofa drought roads activity is now assigned to the ongoing drought roads project. UNDP has financed the procurement of some construction equipment equivalent to one small spread. ERA intends to move some of these pieces of equipment to the ongoing drought relief roads to complement the present units in order to expedite the construction work which is presently behind schedule. Thus, there is no spare equipment available for use on this project at the present time.

In order to maximize the utilization of time and the labor intensive approach as adopted for this project, ERA/RRD will require a minimum amount of equipment to support the construction operation of the labor intensive project scheduled to start in November 1976, at the first construction camp to be located in the vicinity of the Waito River crossing. The GOE will local funds will purchase the initial mobilization equipment and hand tools off-shelf in Ethiopia. The minimum equipment requirement and the list of hand tools for this purpose is shown in Annex XXIII.

AID-financed U.S. equipment for complete mobilization is expected to be procured by April 1977 and arrive on site by March-April 1978. Fast moving spare parts in the amount of 15 percent of the equipment value CIF port of entry will be purchased along with the major U.S. procurement. The equipment list is shown in Annex XXIII.

2. Procurement Procedure

a. Equipment

Procurement of all equipment to be financed by AID under this project will be carried out by the ERA Procurement Office in accordance with the relevant GOE regulations, proven to be satisfactory, and AID Handbook 11 - Country Contracting. The authorized source of procurement will be AID Geographic Code 000.

Whenever it is practical and possible to do so, US Government-owned excess property will be utilized in lieu of new equipment.

b. Spare Parts

In addition to purchasing 15 percent spare parts with the initial off-shore consignment, spare parts in the estimated amount of 35 percent of AID-financed off-shore equipment cost are also expected to be purchased by GOE for the life of the project. Spares will be purchased by ERA through their established procurement procedure, i.e. off-shore from local dealers or directly from manufacturers under ERA bulk ordering procedures.

c. Construction Material

All procurement of cement and reinforcing steel will be purchased in Ethiopia in accordance with the established ERA Procurement Procedures.

d. Petroleum, Oil and Lubricants

All POL will be purchased by ERA in Ethiopia and will also conform to ERA established procurement system.

3. Implementation Schedule

The Rural Roads Division, situated within the Ethiopian Roads Authority, will have responsibility for technical implementation of the project. It is estimated that in the initial stages of construction by means of labor intensive methods, RRD will be able to construct about 3-km of road per month during the dry seasons. It is further estimated that the fully mobilized construction operation with the proposed labor/equipment mix will be able to construct about 10-km. of road per month during the dry seasons. Allowance is also made for difficult construction work expected to be experienced in some sections of this road (approximately 10-km.) in mountainous terrain.

Implementation for the construction of about 230-km. of road under this project is divided into four distinct phases:

Phase I: Phase I of the project implementation is estimated to require approximately nine months and will commence after the signing of the Grant Agreement on or about June 30, 1976. The following activities are programmed under this phase:

- a. Surveying will be performed for the Waite-Arbore section of the road alignment (a survey has already been made of the road from Turmi to Kelem and the distance is 77-km),
- b. The soils investigation for surfacing material for the total project will be initiated,
- c. With AID approval, GOE will prepare specifications, bid documents and make contract awards for procurement of U.S. equipment along with 15 percent fast moving spare parts,
- d. GOE will procure hand tools, construction material and the minimum equipment necessary for mobilization of the labor intensive operation off-shelf in Ethiopia,
- e. The first construction camp at Walet River will be completed (to be followed by expansion in the near future to enable this base to become a permanent maintenance camp),

- f. GOE will commence road construction by labor intensive methods, fabricate concrete culverts and place some surfacing where needed most,
- g. The spare parts expeditor/mechanic will be assigned,
- h. The GOE will increase the ongoing construction work on the section between Arba Minch and Waito River and provide full access to the starting point of this project at Waito River.

In the first month of this phase, the spare parts expeditor will be assigned to the project and will initiate procurement of hand tools and minimum support equipment to start the labor intensive approach. Phase I will end with the award of the contract for purchase of off-shore equipment (see PPT, Annex XXI).

Phase II: This phase will follow the award of contracts to suppliers of U.S. equipment. Implementation is estimated to require approximately twelve months including a rainy season of about five months. The following activities will take place:

- a. Road construction by labor intensive methods, fabrication and placement of culverts (placement of surfacing material will continue) anticipated that 18 percent of the total project will be completed by the end of this phase,
- b. The spare parts expeditor, in addition to helping the ongoing project, will help expedite the clearance and delivery of equipment from the port of entry to the project site,
- c. The survey and soils investigation for surfacing material will be completed for all sections of the road,
- d. Construction of the "section camp" at Dimeka will start. This camp will initially serve as a construction camp until the facilities are expanded for accommodation as a "section camp."
- e. A bailey bridge on the Waito River will be erected by ERA in conjunction with the ongoing E-2 project.

Phase II ends at month 21 with delivery of off-shore equipment to the project site and completion of the mobilization effort. Full mobilization will result in the project moving from a highly labor intensive operation to a labor/equipment operation.

Phase III: During this phase which is expected to cover approximately 24 months, two construction units will be functioning simultaneously - one at Waito to continue working southwesterly towards Arbore; this will be primarily a labor intensive operation, with some equipment to complement and expedite the work. The second unit will start at Turmi and proceed easterly toward Arbore. This unit will have more equipment and will be less labor oriented as the people in Turmi are nomadic, and the GOE expects

to have labor shortage problems in this area. This phase of construction includes two rainy seasons totalling about ten months. The following activities will take place under this project:

a. The construction of road will continue from the first camp at Waito River southwesterly; culvert fabrication and placement, ford drainage and placement of surfacing will continue,

b. The road construction by equipment and some labor will start from the second location at Turmi going easterly. This second unit will also construct ford drainage crossings, will fabricate and place culverts and will surface the road,

c. Construction of the "section camp" at Dimeka will be completed and the camp will become operational,

d. The spare parts expeditor continues to expedite procurement of parts and deliveries to section camps and assists in repairs of downed equipment.

e. GOE will start preparation for a 10-ton capacity ferry crossing at the Omo River,

f. Maintenance of road section completed under phase I will commence; the unit will undertake some surfacing repairs.

In this phase of road construction, the alignment includes building a road of approximately 10-km. through rough mountainous terrain necessitating some blasting. By the end of this phase, it is expected that the two construction units (east to west) will meet approximately mid-way on the road stretch between Waito and Turmi. At this stage, approximately 65 to 70 percent of the project will be completed.

All equipment from these two units, with the exception of the pieces needed to continue maintenance, will be moved to the camp at Turmi to commence construction in a westerly direction towards Kelem.

Phase IV: This phase, which is estimated to require fifteen months, starts at Turmi with support of all possible available equipment and labor, proceeding westerly to Kelem. This phase of the construction also includes two rainy seasons totalling about ten months. The following activities are planned:

a. The placement of a 10-ton capacity ferry on the Omo River will be completed,

b. A second maintenance camp will be constructed near Kelem, and becomes operational,

- c. The first maintenance unit continues maintenance operations,
- d. The construction of road and drainage fords, fabrication and placement of culverts, and surfacing from Turmi to Keler. At this point construction will be 100% complete.
- e. Spare parts expeditor continues with his support at the project.

Upon completion of Phase IV the project will have left behind as permanent features two operational maintenance camps, one operational section camp and some maintenance equipment with necessary staff to continue ~~the~~ road maintenance work.

PART IV - C. EVALUATION PLAN

C. Evaluation Plan

Southern Gemu Gofa Drought Area Rural Access Roads

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

I. Project Appraisal Report (PAR) - a PAR 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 of little or no utility, a PAR would serve the purpose of examining, early-on key assumptions and other start-up activities necessary for successful project implementation.

Specifically, the following items will be examined:

1. Progress of RFD in securing maintenance and labor personnel for the project, in sufficient number. Delay in project implementation resulting from a failure to recruit same.
2. Progress in ameliorating spare parts problems to the extent that the project can move or continue to move according to schedule.
3. Review of equipment availability. Has/will equipment be provided on a timely basis.
4. Willingness of local villagers to work on construction project. If labor imported any visible sign of distinction between different tribal groups especially to the extent that project progress is impeded.
5. Have appropriate steps been taken, or has work commenced on assuring project accessibility? i.e. accelerated improvement of the Konso-Waito river section of road, planning for the erection of a bailey bridge on Waito river. If not, what is the impact especially with regard to timely completion of project.
6. Any new knowledge after six months of implementation especially of a technical nature that significantly changes scope of project (routings, cost estimates, time required for completion, etc.).

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

- a. 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.

b. Progress being made on:

- (1) Road survey work,
- (2) Soils investigation for surfacing materials,
- (3) Preparation of contract documents, specifications, and award of contract for the procurement of off-shore equipment,
- (4) Procurement of off-shelf items. (e.g. hand tools, construction materials and a limited amount of equipment.) This activity should be completed.
- (5) Completion of first construction camp at the Waito River,
- (6) Commencement of road construction work.

In examining progress in the above areas, achievements will be measured against the original implementation schedule with the view of determining the impact achievement of non-achievement of these activities have on project implementation/success and the planned project completion date. (See Annex XXI).

The PAR will advance recommendation for any corrective action that is deemed necessary.

II. Special Evaluation - A special evaluation of this activity will be conducted at the end of the 21st month of implementation unless findings in the first PAR (I 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. Also Evaluation findings may be also useful for other rural roads activities up for implementation in Ethiopia or other countries. 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 in 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 previous PAR and examine the progress of phase II project activities. Special emphasis will be placed on the availability of project personnel, 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 the following areas:

- (1) Labor intensive road construction,
- (2) Spare parts flow and procurement,
- (3) Camp construction work,
- (4) Bailey bridge erection,
- (5) Delivery of off-shore equipment/other items.

The above 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 program 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 implementation delays; cost occurrence; and the entire design of the project.

D. Evaluation Team

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

III. PAR month 33.

IV. PAR month 45.

V. Close-out Evaluation.

ANNEXES

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- VIII -- Statutory Checklist (Not Attached)
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Southern Gemu Gofa Drought Area Access Roads

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ANNEX I

DEPARTMENT OF STATE TELEGRAM

SUBJECT: Proposed FY 76 Drought Recovery and Rehabilitation Program

1. Summary: On 15 July Project Committee considered proposed FY 76 R and R program as set forth in referenced communications, found it consistent with DAP strategy/objectives as well as congressional mandates and recommended Mission be authorized proceed develop PP. AID/W Ethiopia ABS review 21 July, chaired by AA/AFR, approved this course of action. End summary.
2. Project Committee first considered type of design which should be required as next step, including revised PRP, PAAD amendment and PP. PP decided upon for following reasons: (A) Recognition that sufficient time has passed and experience gained to allow development more specific output indicators and evaluation standards than possible at time 1974 PAAD approach, and (B) Fact this activity would now be funded under food and nutrition category in regular bureau budget rather than from special congressional appropriation under programs functional category. See also comments this subject in septel country review summary. However, in view existing documents (Refs) and desire expedite approval process for type of assistance being proposed, believe it not necessary request revised PRP, but can proceed directly to PP. This decision does not prejudge whether project or program assistance most desirable and various implementation devices may still be considered.
3. As indicated above, require input/output indicators, together with evaluation standards/requirements. In this regard, recommend evaluation be undertaken of on-going PAAD-funded R and R activities and other relevant RRC programs and results incorporated as part of PP presentation.
4. Project linkage and coordination with other AID-supported activities (e.g. Rural Roads, ASLS, MPP, etc.), as well as GOE and other donor drought and regular developmental activities must be spelled out.
5. Mission should provide rationale for termination discrete R and R program after FY 76. Does Mission foresee no continuing R and R support activities contemplated under other proposed activities? What would be GOE expectations/preferences for discrete R and R activity?
6. Projections/estimates for amounts needed in FY 76 for continuing emergency requirements should also be provided.
7. Would also be useful for PP to address extent to which U.S. PVOS could/may be engaged in this activity.

MAY 20 1976

VH-12/11/10

Our Ref. No.

Your Ref. No.

Date 20/5/76

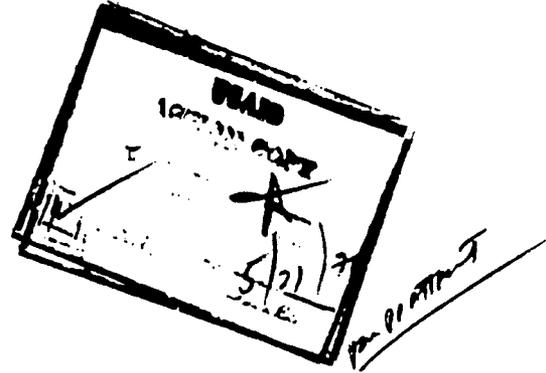


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PROVISIONAL MILITARY GOVERNMENT OF SOCIALIST ETHIOPIA

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Relief and Rehabilitation Commission

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Subject

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Attention to



Dr. John L. Withers,
Director
USAID, Mission to Ethiopia ✓
P.O. Box 1014
Addis Abeba

Dear Dr. Withers:

This will reconfirm the request of the Provisional Military Government of Ethiopia for the continued assistance of the United States in support of the Relief and Rehabilitation Commission's program in Southern Ethiopia.

As you know, the specific projects we have identified for your review and consideration have included:

- Nutrition/Health Surveillance program
- Webe Shebelle River Valley Settlement
- Awash Valley Settlement
- Southern Gemu Gofa Valley Development
- Nomadic Settlement at Dolo

I hope that you will give these projects your earliest consideration for support in 1976.

CSAID ACTION	
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Sincerely yours,

Sheimelis Adugna,
Chief Commissioner

ANNEX III

Grant Authorization

Ethiopia - Recovery and Rehabilitation Project

Pursuant to the authority vested in the Administrator of the Agency for International Development ("A.I.D.") by the Foreign Assistance Act of 1961, as amended, I hereby authorize the establishment of a grant to the Government of Ethiopia of an amount not to exceed five million United States dollars (\$5,000,000) to assist in financing the United States dollar and local currency costs of the Recovery and Rehabilitation Project in Ethiopia subject to the following terms and conditions.

1. Goods and services financed with United States dollars assistance provided under the Grant shall be procured from areas included in Code 000 of the AID Geographic Code Book.
2. Goods and services financed with local currency assistance provided under the Grant shall be procured from Ethiopia.
3. The Grant shall be subject to such other terms and conditions of A.I.D. may deem advisable.

Administrator

Date

ANNEX IV

CERTIFICATION PURSUANT TO

Section 611(e) of the

FOREIGN ASSISTANCE ACT

As Amended

I, Dr. John L. Withers, the principal officer of the Agency for International Development in Ethiopia, do herewith certify that in my judgment, Ethiopia has both the financial capability and human resources to maintain and utilize effectively goods and services procured under the capital assistance sub-project B (Southern Gemu Gofa Drought Roads) included within the Recovery and Rehabilitation Grant.

This judgment is based upon the record of implementation of AID-financed projects in Ethiopia and the results of the consultations undertaken during intensive review of this new project.

A handwritten signature in cursive script, reading "John L. Withers", is written over a solid horizontal line.

John L. Withers
Director, USAID/Ethiopia

25 May 1976

Date

S U M M A R Y

U.S. GOVERNMENT DROUGHT ASSISTANCE TO ETHIOPIAFY 73 TO DATE (U.S. \$)U.S. \$FY - 73

Food	4868 MT	895,150.00 (a)
Non-Food (c)		25,561.38

FY - 74

Food	58500 MT	14,728,418.05 (b)
Non-Food (c)		2,208,621.32

FY - 75

Food	6230 MT	2,599,236.00 (a)
Non-Food (c)		8,399,770.00

FY - 76

Food	5000 MT	1,375,000.00 (a)
Non-Food (c)		<u>321,870.00</u>

TOTAL:-	<u>74598 MT</u> =====	<u>30,553,627.75</u> ●=====
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-
- (a) Includes cost of transport.
- (b) Includes cost of transport and food stock transfers from Kagnev Station.
- (c) Comprises emergency medicine supplies, transport, relief supplies, etc.

ACTIVE ETHIOPIA DROUGHT RELIEF RECOVERY AND REHABILITATION GRANTS

ANNEX VI

A) AID/W Allotments:

<u>Sector Category/Activity</u>	<u>Grant Number</u>	<u>Amount</u>	<u>Sector Total</u>	<u>Activity Total</u>	<u>Sub-Obl. to date</u>
Total General Grants	Eth.PAAD # 1	8,000,000			
1. R&R General Grants	663-F-601	(4,000,000)			
	663-F-601A	(3,800,000)			
	663-F601B	(200,000)			
2. Sectoral Categories					
a. Livestock & Water			1,250,000		
1. Sidamo Pastoralist Surface Water				1,210,000	1,210,000
2. VolAg Wells				178,000	178,000
b. Agriculture and Resettlement			900,000		
1. Gode Accelerated Food Production				700,000	700,000
2. Assistance to small scale settlement				149,500	149,500
c. Crop Protection			1,250,000		
1. Emergency Small Farmer- Crop Protection				1,200,000	1,200,000
d. Rural Roads			4,600,000		
1. Southern Rural Access Roads				<u>4,562,500</u>	<u>4,562,500</u>
Sub-Totals			<u>8,000,000</u>	<u>8,000,000</u>	<u>8,000,000</u>
 B) <u>Mission Allotments:</u>					
a. Emergency Relief Grant Wells	2/NWRC/75	(663-0186)		100,000	100,000
b. Christian Relief Committee (CRC)	CRC/1	(663-0185)		100,000	100,000
c. Relief/Admin Communications	6/COMM/75	(663-0184)		<u>150,000</u>	<u>150,000</u>
Sub-Totals				<u>350,000</u>	<u>350,000</u>
 C) <u>FDRC Allotments:</u>					
a. Medicine	3/MED/75			15,000	15,000
b. Feeding Program	UNICEF-1/75			100,000	100,000
c. Grain Mills	4/Mill/s75			20,000	20,000
d. Manpower Assistance	5/PCV/75	(663-0183)		<u>51,870</u>	<u>51,870</u>
Sub-Total				<u>186,870</u>	<u>186,870</u>
 Grant-Totals			<u>8,800,000</u>	<u>8,536,870</u>	<u>8,536,870</u>

ANNEX VIISUMMARY
Current Recovery and Rehabilitation Activities - Southern Ethiopia*

<u>Province</u>	<u>Activity</u>	<u>(All sources-\$US 000)</u> <u>Estimated Investment</u>	<u>Status</u> <u>(as % of compl)</u>
<u>Harraghe</u>	(1) Nomadic resettlement, Gode-Kelafo (includes USAID/E Activity E-2)	3.000	90%
	(2) Well Rehabilitation	.300	100%
	(3) Imi-Gode Road (USAID/E Activity E-2)	.150	5%
	(4) Small Scale Rehabilitation/ resettlement Gebe Gebu, Kebri Dahar, Kelafo-Mustahill	.150	75%
	(5) Jijiga Rangelands Project (IBRD)	12.300	1%
	(6) Storage Construction (12,300 MT)	.150	100%
	(7) Catchment Ponds (20)	.075	100%
	(8) Well Construction (EPID/UNICEF)	.050	100%
	(9) Crop Protection (USAID/E Activity E-4)	<u>.100</u>	95%
	SUB-TOTAL	\$ <u>16.275</u>	
<u>Bale</u>	(1) Small Scale Nomadic Rehabilita- tion (NSCF/UNICEF)	1.000	50%
	(2) Nomadic Resettlement (Includes USAID/E Activity E-6)	.500	75%
	(3) Ginnir-Imi-El Kere Road (Includes USAID/E Activity E-2)	1.250	25%
	(4) Storage Construction (1000 MT)	.025	100%
	(5) Catchment Ponds (EPID)	<u>.010</u>	100%
	SUB-TOTAL	\$ <u>2.785</u>	

<u>Province</u>	<u>Activity</u>	<u>(All sources-\$US 000) Estimated Investment</u>	<u>Status (as % of compl)</u>
<u>Damo</u>	(1) Negelle-Wachile-Mega/ Filtu-Dolo Road (Includes Activity E-2)	3.000	30%
	(2) Southern Rangelands (IBRD)	18.600	1%
	(3) Sidamo Surface Water (USAID/E Activity E-1)	2.000	25%
	(4) Well Construction (Includes PRC and USAID Activity E-6)	.300	15%
	(5) Catchment Ponds/Wells (EPID)	.100	100%
	(6) Storage Construction (2000 MT)	<u>.075</u>	100%
	SUB-TOTAL	\$ <u>23.975</u>	
<u>Gemu Gofa</u>	(1) Arba Minch-Konso-Jinka Road (USAID/E Activity E-2)	1.600	50%
	(2) Small Scale Rehabilitation	.500	50%
	(3) Storage Construction (1700 MT)	.075	100%
	(4) Catchment Ponds (EPID)	<u>.015</u>	100%
	SUB-TOTAL	\$ <u>2.190</u>	
Total Estimated Investment:		\$ <u><u>45.225</u></u>	

* As of March 25, 1976

ANNEX IX

Sub-Project Implementation Agreement

Ethiopia Recovery and Rehabilitation Project (Sub-Project, Section A)

Grant: 663-

Sub-Project: Nutrition/Health Early
Warning System-Drought
Area Assessment

Number: E-7

1. Description of the Activity: Sub-project Section A, which aims at precluding future famine as a result of drought and other natural disasters, will consist of the establishment and operation, over a 36-month period, of a national system of human and environmental assessment, reporting and evaluation for the purpose of identifying and resolving immediate and potential threats to human survival.

In addition to the provision of immediate information, the system, over time, will establish first time comprehensive and integrated base line data to aid in the preparation and consideration of regional development planning and for specific sectoral programs of individual Ethiopian Government agencies.

Under the supervision of the Relief and Rehabilitation Commission (RRC), through the mechanism of a coordinating technical information service secretariat, the staff, equipment and reporting capability of seven government institutions, including the RRC, will be augmented and strengthened. An eight government organization, the Central Statistics Office (CSO), will be additionally augmented and strengthened to provide a full capability for the collation, analysis and evaluation of collected data produced through the expanded reporting system. These institutions are:

1. RRC
2. CAA (Nat.)
3. MOA (EPID, PFD)
4. ENI
5. LMB
6. CSO
7. MOE
8. MOFH

In addition to the National Early Warning System (EWS), the sub-project includes an initial component for the continuation of immediate field assessment and monitoring of present drought affected areas (Drought Area Assessment) which will be conducted contemporaneously with the establishment of the EWS. The Drought Area Assessment (DAA) component will be subsumed within the EWS on achievement of its fully functioning status.

The total cost of the sub-project is estimated at \$UE6.727 million of which \$US1 million, or 14.9% is to be provided under the Grant. The Ethiopian Government contribution will provide \$US2.194 or 32.6%, with other external donors, notably UNICEF, IBRD, SIDA, ODM and WHO, providing \$US3.533 or 52.5% of the total cost.

The sub-project contemplates support of seven distinct component areas, including the DAA, above. These component areas are:

1. Operation of the Secretariat within the RRC.
2. Operation of the DAA.
3. Operation of the EWS/DAA data processing support section within the CSO.
4. Conduct of Crop Assessment program.
5. Conduct of Market/Pastoral Assessment program.
6. Conduct of Nutrition Assessment program.
7. Conduct of Climate Assessment program.

The AID contribution under this sub-project will provide limited off-shelf equipment, operating and salary expenses for headquarters (Secretariat, CSO) field activity; and training and recurrent costs involved with the conduct of the Market/Pastoral Assessment program.

2. Implementing Agency:

- (a) Sub-project Section A will be the obligation of and will be carried out by the Government of Ethiopia acting through the Relief and Rehabilitation Commission (RRC) utilizing a coordinating mechanism of a discrete Secretariat responsible for coordinating the resource inputs and program outputs of the participating Ethiopian Government agencies. The RRC will be represented by: Aklilu Mewaa, Executive Secretary.

- (b) Names of persons in the RRC/TIS Secretariat whose signatures shall be accepted for required certification in connection with disbursement requests, procurement, reporting and such other purposes as may be required.
- (1) Disbursements: Shimelis Adugna, Aklilu Mewace,
 - (2) Procurement: Shimelis Adugna, Aklilu Mewace,
 - (3) Reporting: Shimelis Adugna, Aklilu Mewace,
- (c) Definition of Responsibilities:
- (1) RRC: The RRC Secretariat will be responsible for the overall collaborative planning and implementation of the sub-project to include support of the Project Implementation Group (PIG) representing the individual institutions involved; support of the interministerial technical working group (TWG) which provides overall technical support; administration and execution of the DAA; overall accounting and records, including, regular progress reporting to USAID on behalf of the RRC and all other matters pertaining to the successful implementation of the sub-project.
 - (2) CAA: The Meteorological Division of CAA will be responsible for establishing and maintaining an expanded network of field stations to include the procurement of required additional equipment; the recruitment and training of required observers; the supervision of meteorological field operations; the interpretation of meteorological data; the accountability of funds and progress to the RRC.
 - (3) MOA: The EPID and PPD divisions of the MOA will be responsible for setting up an expanded network of crop and market reporting stations; the procurement and maintenance of crop reporting equipment; the recruitment and training of crop reporting agents and supervision of crop reporting; the interpretation of crop information and the accountability of funds and progress to the RRC.

- (4) ENI: The ENI will be responsible for setting up a network of field extension agents who will collect data on food consumption and human nutritional status; the procurement of required measurement equipment; the recruitment and training of required nutrition extension agents; the supervision of food consumption and nutritional status assessment activities; the interpretation of nutritional data; and the accountability for funds and progress reporting to the RRC.
- (5) LMB: LMB will be responsible for the establishment of an expanded system of rangeland monitoring and livestock market reporting; procurement of required equipment; the recruitment and training of field personnel; integration of the component with planning by the ILCA; field supervision; the interpretation of rangeland and animal production and market data; and the accountability for funds and progress reporting to the RRC.
- (6) CSO: The CSO will be responsible for the establishment of a statistical and data processing support unit; recruitment and training of middle level data processing stage; the provision of manual data processing facilities during the initial stages of the activity; the preparation of required computer programming; provision of adequate computer facilities; the accountability for funds and progress reporting to the RRC.
- (7) MDE: The MDE will be responsible for the provision of teachers/students to be trained in connection with the implementation of the overall sub-project and for the accountability for progress reporting to the RRC.
- (8) MOPH: The MOPH will be responsible for collecting epidemiological, health status information; the supervision of health and morbidity data collection; the interpretation of health statistics and the accountability for funds and progress reporting to the RRC.

3. Implementation Schedule

As described within the Project Paper.

4. Targets/Objectives

As set forth in the Project Paper.

5. Budget

As set forth within this agreement, it envisaged that the United States will provide funds for this sub-project in the amounts identified more fully by line item components shown in Section III, B., 1., Financial Analysis, of the Project Paper (Table I).

6. Non-AID/GOE Inputs

This sub-project contemplates assistance from the World Bank, Swedish International Development Association, UNICEF and the World Health Organization, as described within the Project Paper.

7. Reporting Requirements

In addition to such special financial and physical reports which may be required from time to time by USAID, the RRC shall prepare, on not less than a quarterly basis during the life of the sub-project, a report which shall set forth;

- (a) The overall implementation status of the sub-project in relation to the goals and objectives establish in the Project Paper.
- (b) According to a specific RRC assessment of the individual progress of each individual participating institution toward the goals and objectives for that agency.
- (c) A statement identifying the problems affecting the implementation of the sub-project and indicating actions taken by the RRC to resolve these problems.

- (d) A financial status report setting forth disbursements by the RRC to each individual institution, expenditure/commitments of each institution against the approved budget and balance remaining.

The RRC shall additionally participate with USAID in the evaluation of the sub-project at intervals set forth in the implementation schedule described in the Project Paper.

The RRC shall additionally prepare a sub-project completion report not later than the 37th month following the initiation of the sub-project which will comprehensively set forth the status of the sub-project and the assessment of the RRC as to the degree to which it has accomplished the goal and purposes for which it was designed.

In the absence of required reports from the RRC, disbursements from the grant will not be authorized by USAID.

8. End-Use Accountability

In addition to such documentation as AID may require in accordance with other provisions of the agreement, the RRC shall be accountable to AID for the goods provided herein until receipt and acceptance by AID of a completion report. It shall be the intent of AID in this regard that materials procured by the RRC and participating institutions described and no other until such time as the GOE and AID shall mutually agree to alternative utilization. All financial records, receipts, general records and reports relating to the sub-project will be maintained by the Government of Ethiopia for a period of not less than three years after the termination of the implementation period and be made available to the USG for inspection on request.

9. Modification of the Sub-Project

This sub-project may be modified from time to time by the issuance of additional sub-project implementation agreement amendments by USAID/E with the concurrence of the RRC. In no case any modification of the sub-project be made without prior approval of USAID/E.

10. Other

The Project Paper, Recovery and Rehabilitation - Ethiopia, approved by AID on _____, is hereby incorporated as an integral part of this sub-project agreement. The budget

work plan, implementation schedule and specific descriptions of goals/objectives, requirements of the RRC and individual participating institutions to be met as part of the design of this sub-project, shall be in accordance with the provisions of such Project Paper.

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project: 76 Months
From FY: 76 to FY: 79
Total U. S. Funding: \$1,000,000
Date Prepared: 3/77

Project Title & Number: Nutrition/Health Early Warning System

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS												
<p>Program or Sector Goal: The broader objective to which this project contributes:</p> <p>To prevent recurrence of future famines in Ethiopia as the result of drought and other natural disasters.</p>	<p>Measures of Goal Achievement:</p> <p>Famine in Ethiopia as the result of drought and other natural disasters is controlled.</p>	<p>Observation: No famine situations reported to exist in Ethiopia as a result of drought or other natural disasters.</p>	<p>Assumptions for achieving goal targets:</p> <ol style="list-style-type: none"> 1. Govt. of Ethiopia (OGE) continues to attach high priority to elimination of famine conditions. 2. OGE devotes correspondingly high priority to national planning for purpose of developing rural food production/distribution. 3. Immediate material resources are available to the Govt. to prevent famine. 4. Govt. aware sufficiently in advance of potential famine situation to take required action. 												
<p>Project Purpose:</p> <p>The purpose of this activity is to establish a fully functional reporting, processing and interpretive food/nutrition/health early warning system providing government planners with a flow of information on regional food production and the nutrition and health status of representative population groups in the country.</p>	<p>Conditions that will indicate purpose has been achieved: End of project status:</p> <p>A fully functional system of early warning, assessment, reporting and evaluation of data covering the human and environmental conditions in Ethiopia is established and provides information and recommendations for action to preclude famine to Government.</p>	<p>The existence of a functioning early warning system providing the information required for/accepted by government planners to assess the current/potential nutrition/health situation in Ethiopia.</p>	<p>Assumptions for achieving purpose:</p> <ol style="list-style-type: none"> 1. Govt. continues give priority to development of overall institutional component. 2. Individual ministerial elements provide required reporting input. 3. Political stability permits staff to operate in the field. 4. Individual ministerial elements develop planned capacities. 5. Govt. plans/obtains/utilized sufficient reports in advance to prevent famine. 												
<p>Outputs:</p> <p>A nutrition/health early warning system directed by a central Secretariat coordinating the activities of and evaluating and collating information received from:</p> <ul style="list-style-type: none"> - Drought area field operation - RRC - Crop assessment - MIA - Market & Pastoral assessment - IAP - Nutrition assessment - DNI - Climate assessment - CAA - Health assessment - MHI - Centralized, fully functional data processing unit - CCD 	<p>Magnitude of Outputs:</p> <ul style="list-style-type: none"> - Class 1, Class 2, Class 3 & Class 4 meteor. stations staffed & equipped by CAA. - Crop assessment units staffed and equipped by MIA. - Personnel operative data processing unit of CCD. - Marketing & pastoral assessment teams operating in the IAP. - Nutrition assessment units operating for DNI. - Health assessment unit operating for MHI. 	<p>Effective field structure operated by the RRC, MIA, IAP, DNI, CAA & MHI functioning to produce information for the Central Secretariat.</p> <p>Efficient data processing unit operating within CCD.</p>	<p>Assumptions for achieving outputs:</p> <ol style="list-style-type: none"> 1. Central Secretariat effectively coordinates inputs from various ministries in data collection effort. 2. CCD accepts validity of system input 3. CCD has capacity to analyze, evaluate and provide solution recommendations whose validity accepted by Government. 												
<p>Inputs:</p> <p>Manpower</p> <p>(1) Donor - UNICEF 12 MM/1 = 12 MM INR 12 MM x 3 = 36 MM GM 12 MM x 21 = 24 MM RRC 12 MM/1x1 = 12 MM</p> <p>(2) OGE Professional Staff</p> <p>Project Implementation Group</p> <ul style="list-style-type: none"> CAA - Meteorologist MIA - Agricultural economist IAP - Livestock specialist DNI - Nutrition statistician MHI - Health officer CCD - Statistician MDE - Liaison officer RRC - MIA-statistician (Head of project) RRC - Economist (Head of Technical Information) Economist (Technical Reporting officer) <p>Statistical & Data Processing Unit</p> <ul style="list-style-type: none"> CCD - 2 statisticians 3 Asst. statisticians 1 data processing wr. 1 Computer programmer <p>Administrative and supporting staff as listed in staff list.</p> <p>Field Operations</p> <ul style="list-style-type: none"> AA/RRC Head of field operations 3 supervisors Surveyors and drivers MM/CAA/DNI - 10 Senior supervisors DNI/CAA/MIA Supervisors MIA/CAA/DNI/IAP - 31 Regional supervisors MIA/CAA/DNI/IAP - 95 Area supervisors MIA/CAA/DNI/IAP 1615 Reporters/observers <p>(3) Finances (in U.S.\$)</p> <table border="1"> <tr> <td>Donors - UNICEF</td> <td>600,000</td> </tr> <tr> <td>INR</td> <td>1,100,000</td> </tr> <tr> <td>SIA</td> <td>1,875,000</td> </tr> <tr> <td>ICMID</td> <td>1,000,000</td> </tr> <tr> <td>OGE</td> <td>2,125,000</td> </tr> <tr> <td>Total</td> <td>6,727,000</td> </tr> </table> <p>(4) Commodities</p> <ul style="list-style-type: none"> UNICEF - meteor. equipment INR - vehicles, crop assessment equipment SIA - ICMID - personnel expenses, equip. 	Donors - UNICEF	600,000	INR	1,100,000	SIA	1,875,000	ICMID	1,000,000	OGE	2,125,000	Total	6,727,000	<p>A Central Secretariat evaluating information and producing a monthly situation report and special reports as needed.</p>	<ol style="list-style-type: none"> 1. Required manpower in place 2. Equipment in place in type/quantity planned. 3. Computer programmers ready and operating. 4. Monthly reports being produced 5. Planned financing made available by both donors and OGE as/when required for implementation. 	<p>Assumptions for providing inputs:</p> <ol style="list-style-type: none"> 1. Funds available in amount programmed from OGE and donors 2. Technical assistance provided in timely manner in non. required. 3. Government manpower available when and in numbers required. 4. Equipment procured when/amount/type required.
Donors - UNICEF	600,000														
INR	1,100,000														
SIA	1,875,000														
ICMID	1,000,000														
OGE	2,125,000														
Total	6,727,000														

ANNEX XICRITICAL PERFORMANCE INDICATORS

<u>No.</u>	<u>Description of Activity</u>	<u>Responsible Agent(s)</u>	<u>Time</u>
1	Project agreement signed	USAID/GOE	1
2	Sample framework completed (prior action)	CSO	1
3	Complete review of output format	CSO	1
4	Met station equipment arrives Ethiopia	CAA	1
5	Field reports completed, processed	ENI, LMB, CSO	2
6	Rangeland reporters, trg. equipped, posted	LMB	4
7	Staff for Class I, III, V stations, trg. posted	CAA/LMB/MOA/MOE	4
8	National sample framework completed	CSO	1
9	Complete processing of 1st consolidated report	All	1
10	Livestock/grain/market reports agent trg. posted	LMB, MOA	6
11	1st computer prog. tested	CSO	9
12	1st proj. implementation group review	All	9
13	Equipment Class I, II, III, IV met stations arrives Ethiopia	CAA	9
14	50 livestock/crop reporters trg. posted	CSO	9
15	135 met station reporters trg. posted	CAA/LMB/MOA/MOE	10
16	50 livestock/crop reporters trg. posted	LMB, MOA	13
17	20 nutrition reporters trg. posted	ENI	14
18	45 local rangeland reporters trg. posted	LMB	14
19	2nd P.I.G. review	All	15
20	140 local crop reporters trg. posted	MOA	15
21	1st electronic data processing consolidated report	CSO	16
22	Met equipment Class I, II, III, IV stations installed	CAA	17
23	270 Class I, II, III, IV met station agents trg. posted	CAA	18
24	3rd P.I.G. review	All	21
25	Final review of output questionnaires complete	All	21
26	Hand data processing phased out	CSO	25
27	4th P.I.G. review	All	26
28	125 pieces equipment Class I, II, IV met stations installed	CAA	26
29	40 nutrition reporters trg. posted	ENI	26
30	140 local crop reporters trg. posted	MOA	26
31	Target level field reporters reached	All	30
32	125 Class I, II, IV met station reporters trg. posted	CAA	30
33	Final P.I.G. review	All	33
34	Quarterly financial progress reports	PIG	
35	Quarterly progress reports	PIG	
36	USAID evaluations	USAID/PIG	11-26-32
37	End of project report	USAID/PIG	36

TECHNICAL NOTE ON THE BASIC CONCEPTS OF FOOD AND NUTRITION
SURVEILLANCE

Internationally, Food and Nutrition Surveillance is evolving rapidly as a method of monitoring food supply on a micro-basis. It takes into account the fact that while macro-economic data may be of value in assessing and projecting growth rates, such is the variation in the internal distribution of resources in most developing countries, that national aggregates are not discriminating enough to identify regional characteristics. In particular, the distribution of agricultural production as a source of food rather than as an 'economic resource' is not apparent in national statistics.

Where food supply is inadequate, unstable or poorly distributed, within the community, food and nutrition surveillance offers the possibility of identification of trends and the prediction (from the examination of the determinants of production and distribution) of changes in a community's food availability and therefore their nutritional status. As nutrition and health are intimately associated, the combined assessment of health and nutrition are used as indicators of the final effects of food adequacy on the human community.

These ideas can be expressed in ecological terms. The aim of most rural development is to stabilize or improve the balance between man and his environment. Here we are concerned particularly with the balance between man and his environment with respect to food supply.

The concept of 'food supply system' describes the chain of events which delivers food to the consumer. In other words it arranges the 'environmental' factors in an orderly sequence describing the determinants of food production, its distribution and availability. The other side of the ecological equation is described by indicators of health and nutritional status.

The concept of 'food supply system' is the basis for designing a food and nutrition surveillance system. It may be used for a provisional selection of the most important indicators of production and distribution. It must be taken into account in designing the sampling frame. It may be developed into a simulation model for systems analysis. It is the basis for the selection of interpretive criteria when change is observed. It forms the framework for the data matrix which is produced by a surveillance system.

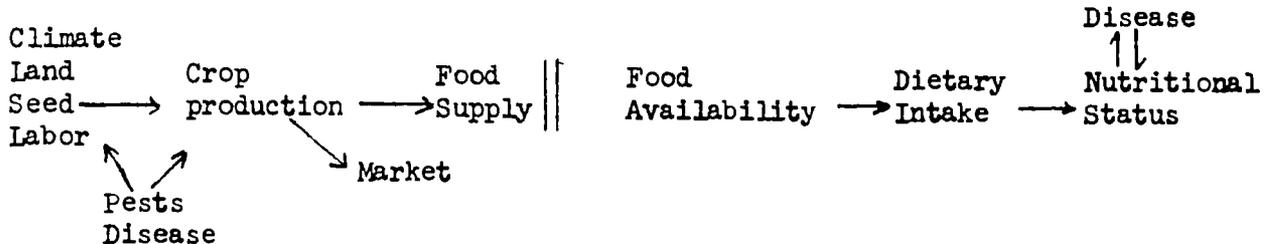
At every point in the food supply system chain, interaction occurs with the society. Communities have learned to adapt, manipulate and maximize the elasticity of relationships in their food supply system. Thus the way a food supply system behaves depends very much on the

community it serves. Pastoralists who have learned to live in a harsh environment with periodic shortages, migrate to make the best use of available pasture share resources during times of shortage, sell selectively to conserve breeding stock during bad years and so on. In these ways they are buffering the effects of adverse changes in their food supply system. Subsistence cropping agriculturalists have their own set of conservation practices. (Interestingly, these are rather less effective than those of the pastoralists.)

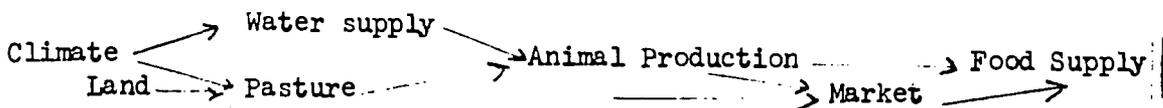
We recognize five main food supply systems in Ethiopia. These are:

1. Subsistence cropping agriculture. Probably 60% of Ethiopia's population grow crops primarily for food. Production which is surplus to their requirements is sold or bartered.

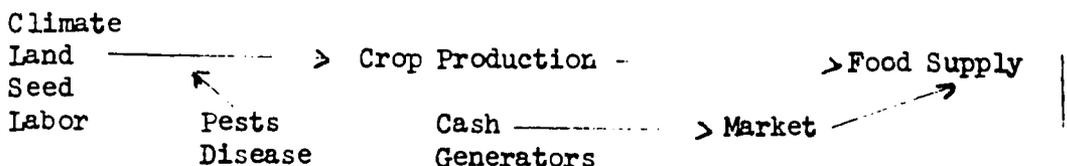
This food supply system may be illustrated as follows:



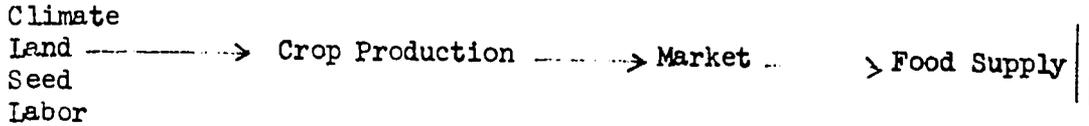
2. Pastoral food supply system. About 16% of Ethiopia's population are semi-nomadic pastoralists. While variations occur, in general they grow crops in good years but are primarily dependent on animal products for food. They eat meat and drink milk but also sell animals in the local markets to buy grain and other commodities. Their food supply system may be illustrated as follows:



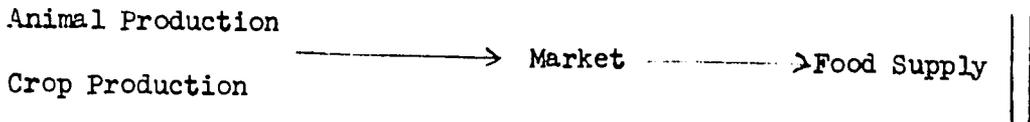
3. Enset and root crop farmers. This food supply system is unique in that it is a 'subsistence' system which is incomplete in itself as a diet of enset or potato is nutritionally inadequate. Thus 'cash' crops -- ginger, honey, etc. -- is produced to exchange for grain and other food commodities to supplement the diet.



4. Cash crop agriculturalists. As well as the larger farms which produce to sell, coffee and cotton is grown as a cash crop. The food supply system is therefore at least in part on the availability of food in the local market.



5. Finally the urban centers and 'non-farm' community are totally dependent on food which they themselves do not grow. It is estimated that only about 22% of Ethiopia's population falls into this category. Their food supply system may be illustrated as follows:



The construction of hypothetical flow-diagrams such as these is the first step in the design of a good and nutrition surveillance system. From these diagrams a few variables are selected to act as indicators of each food supply system. Thus, for example, the variables which have been selected to monitor rangeland areas in the drought area surveillance program are as follows:

Climate	Pasture	Animal Production	Market	Nutritional Status	Disease
Rainfall		Herd sizes Animal mort. off-take rates	Animal & grain prices	Weight-Height-	Mortality Rates

A similar process is the basis for out-put format and questionnaire design for the early warning system. As data is collected, these 'models' will be validated, refined and made the basis for prediction when a change is detected.

There are three potential data sources available for food supply system surveillance: ground reporting, low altitude serial surveillance and remote sensing based on satellite carried sensors. Each has particular uses and advantages. It is possible to construct a matrix relating the variable class to the most efficient data source. Ideally, an integrated three data collection system which makes the best use of all three sources can be constructed. However, remote sensing methods need to be calibrated against 'ground truth' from the locality where they are being used. In Ethiopia this information is not yet available so for Ethiopia's national system emphasis will be given to establishing an efficient ground reporting system during the initial stages of implementation.

The design of this project calls for monitoring techniques across a wide range of information - encompassing meteorology, crops, pasture, markets, nutrition and health.

This method has been chosen in favor of a surveillance technique confined to direct human measurement for two main reasons.

The first is a general one stemming from a belief that the measurement of nutritional and health status alone is a measurement of the patho-effects of food intake and environmental factors. It, therefore, lacks predictive value and restricts the range of information available to a documentation of pathological or near pathological situations.

The second relates specifically to the situation in Ethiopia. In contrast to a food economy where production has been stabilized by an efficient agricultural technology and where distribution patterns are unlikely to alter dramatically, the Ethiopian subsistence agricultural system is directly open to the effects of climate, pests and the like, and is, therefore, subject to fairly wide fluctuation in production from year to year. As this forms the source of food for many people directly, a surveillance system must include the determinants of production.

CONSOLIDATED FOOD AND NUTRITION INFORMATION SYSTEM
ANALYSIS OF DATA FROM THE OGA DEN - HARRAGHE PROVINCE

A SYNOPSIS

May - June	1974	(RRC)
November - December	1974	(ENI)
February - March	1975	(CFNIS)
June - August	1975	(CFNIS)

INTRODUCTION

The drought situation in the Ogaden has been documented by four studies carried out between May-June 1974 and June-August 1975. This report presents comparative information from these four surveys.

Each survey followed much the same plan. Significant parameters which were either determinants of food production or indicative of the effects of shortage on human beings were identified and information sought which would express the state of each in quantitative terms. Variations in sampling and technique occurred from survey to survey making it impossible to compare certain categories of information. Some measurements have been excluded from this report for this reason or because the information is difficult to interpret or because it is thought to be unreliable. However, despite these difficulties a number of significant trends can be identified.

This document is intended to serve several functions:

1. It records significant events in the genesis of the present food shortage in the Ogaden. While this is now a matter of history and the present situation does not require sophisticated techniques to show that a problem exists considerable confusion existed for a number of months as to the likely course of events and the extent of possible human hardship. The signs of - at first possible - then impending disaster were not apparent to all observers. In fact, predictive indicators of famine are not necessarily obvious during short visits to disaster prone areas. Therefore, by relating measurements made during 1974 to measurements made more recently, it is hoped that this report will underline the significance of predictive indicators in areas which are likely to become short of food and show that it is indeed possible to provide warning before a situation erupts into full-scale nutritional disaster.

2. It shows that it is not only possible but indeed necessary to observe significant features of a food supply system viewed as a whole if human hardship is to be prevented. For too long 'famine' response has been mobilized when severe human hardship is observed. This response is much

too late to avoid serious human sequelae. Rather than rely on 'journalistic - type' reporting of disasters a more objective approach is required which not only measures the effects of food shortage in human terms (reduced nutritional status and increased death rates) but also monitors warning trends in the food supply system in the area. (e.g. climatic change, reduced livestock production, alterations the price of food commodities). Only when these warning signs are treated seriously can a response be initiated early enough to prevent widespread human suffering.

3. It documents the strengths and weaknesses of 12 months experience in food and nutrition surveillance in one of the areas in Ethiopia where this has been carried out. The deficiencies are obvious: tardy reporting, uneven data quality, techniques which are not comparable and obvious inaccuracies in information which presumes to be reliable. We are acutely aware of these defects. On the other hand, the potentials of this concept for Ethiopia should also be recognized. Had the system worked more efficiently and more reliably and had the results obtained been seen to be significant, then much of the confusion surrounding the situation in the Ogaden late in 1974 might have been avoided.

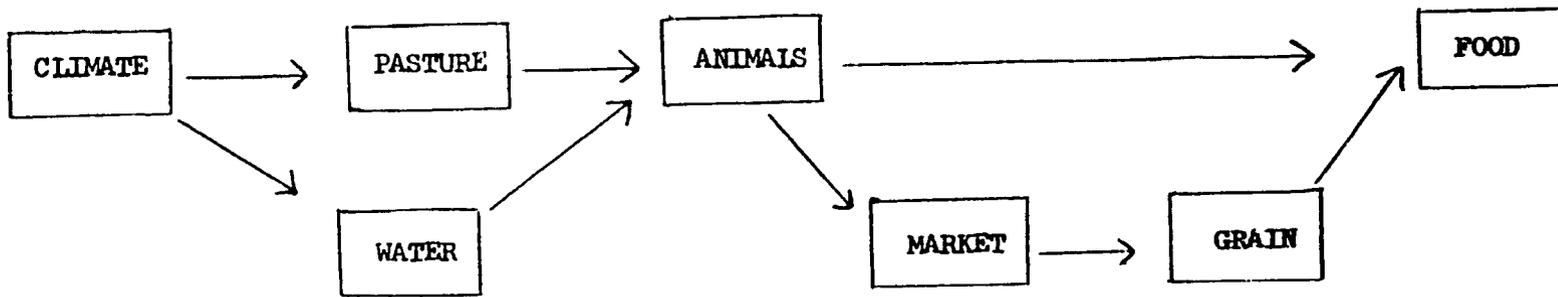
It remains now to strengthen what exists so that the areas of this country vulnerable to food shortages will enjoy at least that measure of security which comes from the knowledge that adequate warning of scarcity will reach the ears of those responsible in time for action to be taken.

PRESENTATION

Figure I indicates diagrammatically the main features of the Ogaden pastoralist's food supply system. The majority of the population depends for its livelihood on animals which provide both a direct and an indirect source of food. Pastoralists in the Ogaden eat meat and drink milk but in addition sell their animals in the local markets in exchange for grain. Many of the pastoralists clans also practice cropping agriculture but apart from people living along the Wabe Shebelle River, grain crops provide only a small part of their food supply in normal times. On the other hand grain exchanged for animals in the markets is an important source of food. It is reckoned that Ogaden pastoralists normally obtain half their energy requirements from grain. The supply in the Ogaden depends largely on the crop in the highlands. Normal demand varies throughout the year as pastoralists tend to take advantage of lower prices after the harvest in November - January. In good times, the sale of one cow in good condition (\$90) would purchase 5 quintals of maize (at \$18 a quintal) sufficient to meet the theoretical energy needs of a family for six months.

Figure I

SIMPLIFIED MODEL OF OGADEN PASTORALISTS
FOOD SUPPLY SYSTEM



Animals depend on pasture and on water which are directly dependent on rainfall. Rainfall in the Ogaden is, therefore, the key to survival for both animals and human beings. The time when rain falls in this area is not constant and varies from north to south. In general, however, the main rains for the year fall between March and May finishing earlier in the south where rainfall is less heavy than in the north. The short rains fall sporadically throughout October and November but despite their short duration are important in breaking the long harsh dry period between June and March.

Thus the parameters which are defined in Figure I give at least a crude concept of the major determinants of food supply system and provide a basis for the studies undertaken. From these parameters, the following variables have been chosen for measurement:

Rainfall: Although a number of climatic variables affect pasture growth (viz temperature, humidity, etc.) rainfall in semi-arid areas is a major determinant. Two stations located in Gode and Kebridehar record the amount of rain that falls in the Southern Ogaden on a monthly basis. As rainfall normally varies considerably from month to month throughout the year, the change observed has been compared to what might reasonably be expected on the basis of average recordings over the previous seven or eight years. From a technical point of view, these averages are not entirely reliable as a minimum period of twenty-five years is required to establish reliable averages. In addition, the variation in rainfall from area to area cannot be adequately recorded by two stations. Nevertheless, significant changes have been observed in the last three years; these are presented here.

Livestock Holdings

Depending on pastoral practices, it is possible to estimate the number of livestock required for human subsistence. This number varies according to the degree of dependence on animals, according to marketing practices and according to the productivity of the animals. This latter depends in turn on animal type, pasture quality and so on. An account of this subject appears in Leslie Brown's book 'Conservation for Survival.' In these studies we were interested in the minimum number of animals required for survival in the Ogaden where 50% of energy foods are bought in exchange for animals, where mature beasts are sold at market and where animals are used for both milk and meat. For the purposes of these studies, we have accepted a value of *7.5 standard stock units (SSU) to be necessary to keep a family of five alive in the Ogaden. The use of the 'SSU concept' makes it possible to assess a herd of different animal types on the basis of their productivity. (See Bron ibid; Harraghe Under Drought, RRC.)

* Based on 500 kg. live-weight.

Pre-drought estimates have been obtained and may be compared with holdings reported at different times over the last twelve months. It should not be imagined that pre-drought holdings represent an optimum number of animals for the Ogaden. There is a considerable amount of evidence available to suggest that the years before 1973 were exceptionally good and that herds expanded in excess of the capacity of the area to support them and yet retain ecological balance. It may be that human numbers now exceed that capacity of the existing herd which has probably been brought into balance with an overgrazed area by the harsh measures of nature.

Estimates of herd size are prone to many errors. Pastoralists are reluctant to report accurately. Where possible herd counts have been made but some clans practice split herd grazing so that only part of the herd can be counted near an encampment. In a time of hardship further reporting bias is likely to be introduced.

As the balance between animals and humans, and animals and the Ogaden environment are the most crucial observations to be made, the technique for making these assessments is constantly under review and has been stated as the most important operational priority we have in rangeland areas.

Market Prices

Because exchange of animals for grain is an important part of the pastoralists economy (grain providing, it is reckoned, 50% of their energy intake in normal times) the prices paid for grain and fetched by animals in local markets have been monitored in the last twelve months.

Prices in these markets appear to respond to supply and demand but are also influenced by other factors. The supply of grain in the Ogaden is largely dependent on the adequacy of the harvest in the Harraghe highlands. This is, of course, affected by climatic and other conditions. Transport costs tend to add to grain prices the further south one goes. The demand for grain, being a staple food, is probably fairly constant as long as purchasing power (i.e., animals) exists.

The supply of animals is presumably directly related to holding size, fertility rates and so to pasture condition. The demand for animals appears complex but is at least influenced to some extent by the condition of animals. In times of severe scarcity, the market appears to become distorted by extraneous factors such as merchants capitalizing on an imbalance between supply and demand, pastoralists deciding not to sell animals at any price and merchants offering ludicrously low prices to pastoralists desperate for food. This complex of factors, added to a reluctance of both buyers and sellers to declare a true market value for commodities makes the interpretation of price changes somewhat difficult. Finally there comes a point of extreme scarcity where trading ceases. Close to this point prices become almost meaningless.

In this study, we have recorded the reported 'normal' (pre-drought) prices for major grain and animal types and compared price changes over the last twelve months against this baseline. It should be mentioned that over the last twelve months a general inflationary effect has occurred but this is probably relatively slight compared with effects associated with the drought.

Nutritional Status

For the purpose of this report we have chosen one indicator of nutritional status - 'weight for height.' This compares the weight of children in the Ogaden with the ideal weight of children of the same height (standards quoted by Jelliffe WHO 1965). For the purposes of comparison, mean values and the standard error of the mean have been calculated of each surveillance round. This does not give a complete picture as it does not indicate the way in which the results were distributed about the mean. These have been reported fully after each study. Mean values, however, provide an easy method of comparing the results of one study with another.

Of the methods available, the weight - height index has been chosen because it indicates a change in body weight independent of age (which is difficult to determine accurately) and expresses the process of body wasting seen in acute and extreme food shortage situations such as has been seen in the Ogaden. It is also appropriate as the predominant type of malnutrition observed is not kwashiorkor but marasmus.

Human Mortality Rates

The death of human beings is the final tragic event in a chain of circumstances associated with extreme food shortage. It should be emphasized that it indicates the final breakdown in food supply, social buffering mechanisms and physiological adaptation to shortage. As such it is a tardy and crude indicator of hardship. Classically the most vulnerable groups of the population are the very young and the very old. When death rates rise in older children or adults, then the situation has become extreme.

In practical terms, this indicator suffers from two further defects. The first is the lack of reliable baseline data for the area concerned. While the Central Statistics Office has reported age specific mortality rates for Harraghe these are probably more appropriate to the highlands where the information has been collected. It is assumed, perhaps erroneously, that pastoralist clans have higher mortality rates particularly in the lower age groups. In fact, we have accumulated considerable circumstantial evidence to suggest that at least from a nutritional point of view pastoralist's children are better off than their highland neighbors but whether or not this is enough to offset the effect of rampant childhood disease is not known. The second difficulty surrounds the reliability of reported information concerning such a tragic and intimate event.

In this report we have presented the results of interviews indicating deaths in families by age groups over the previous twelve months. Thus, the results do not necessarily represent the situation at the time of the survey. As periods of extreme shortage may have occurred at anytime during the reporting period, this information suffers from a lack of chronological precision. The rates are expressed in annual figures per thousand population.

RESULTS

Rainfall

The disturbance of rains in the Ogaden dates from at least two years ago. Table I shows monthly recordings from stations in Kebridehar and Gode both in the Southern Ogaden. Figure II shows the Kebridehar recordings compared with mean monthly recordings obtained between 1957 and 1970. Unfortunately, no recordings are available for the Northern Ogaden. The nearest rainfall measuring equipment is in Jijiga - too high to share the same rainfall pattern.

The deficit in rainfall shown indicates the primary cause of the area's problems. Undoubtedly over population by both animals and humans compounded the tragedy but with the wisdom of hindsight the reduction in observed precipitation which in 'normal years' rarely exceeds 300 mm. was warning enough of what was to follow.

RAINFALL

Fig 1

KEBRE DEHAR OBADEN

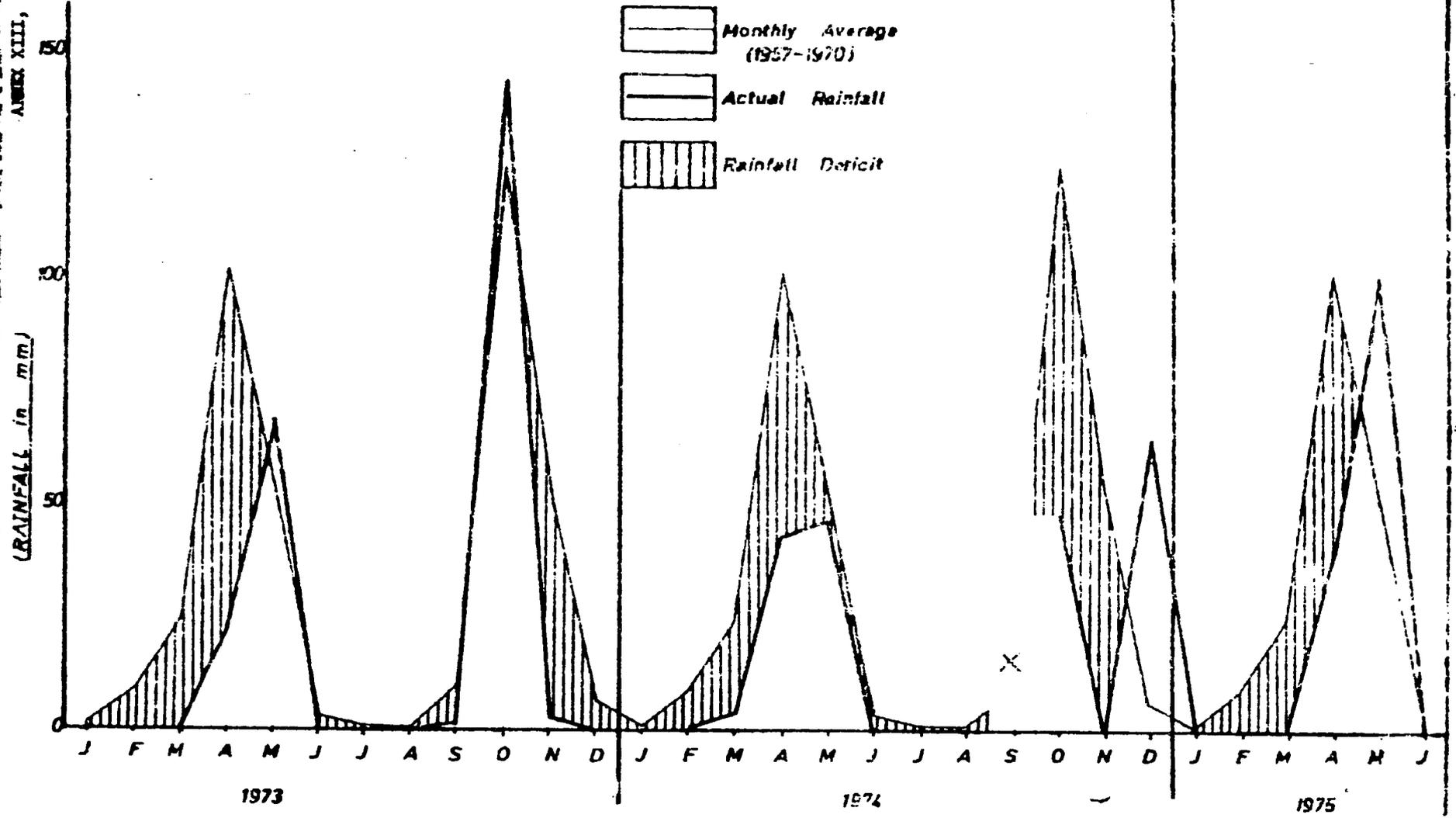


TABLE I

Monthly Rainfall Observations in the Southern Ogaden
(Mean Monthly Rainfall Shown in Brackets)

	G O D E		K E B R I D E H A R	
		(1953-70)		(1957-70)
January 1973	0	(0.0)	0	(1.5)
February	0	(2.0)	0	(9.17)
March	0	(38.7)	0	(24.56)
April	82.8	(169.2)	22.0	(119.6)
May	78.2	(88.8)	68.3	(54.4)
June	0	(1.3)	0	(3.0)
July	0	(0.0)	0	(0.9)
August	0	(0.0)	0	(0.2)
September	0	(5.1)	1.0	(10.6)
October	85.7	(102.4)	143.3	(124.4)
November	6.0	(98.3)	2.5	(52.9)
December	0	(9.2)	0	(6.5)
January 1974	0	(0.0)	0	(1.5)
February	0	(2.0)	0	(9.2)
March	2.6	(38.7)	4.2	(24.6)
April	56.0	(169.2)	43.0	(119.6)
May	x	(88.8)	46.0	(54.4)
June	x	(1.25)	0.0	(3.0)
July	0.0	(0.0)	0.0	(0.9)
August	0.0	(0.0)	0.0	(0.2)
September	0.0	(5.10)		(10.6)
October	16.0	(102.4)	48.0	(124.4)
November	12.0	(98.3)	0.0	(52.9)
December	3.0	(9.2)	64.5	(6.5)
January 1975	2.4	(0.0)	5.0	(1.52)
February	0	(2.0)	0	(9.2)
March	0	(38.7)	0	(24.6)
April	72.0	(169.2)	39.7	(119.6)
May	21.5	(88.8)	100.7	(54.4)
June	0	(1.3)	0	(3.0)

Animal Holdings

The results of the four surveys are shown in Figures III and IV. The 'pre-drought' holdings per family (June 1973) were reported during the June - August 1975 surveillance round and correspond at least fairly well with holdings reported in May - June 1974: for the year before:

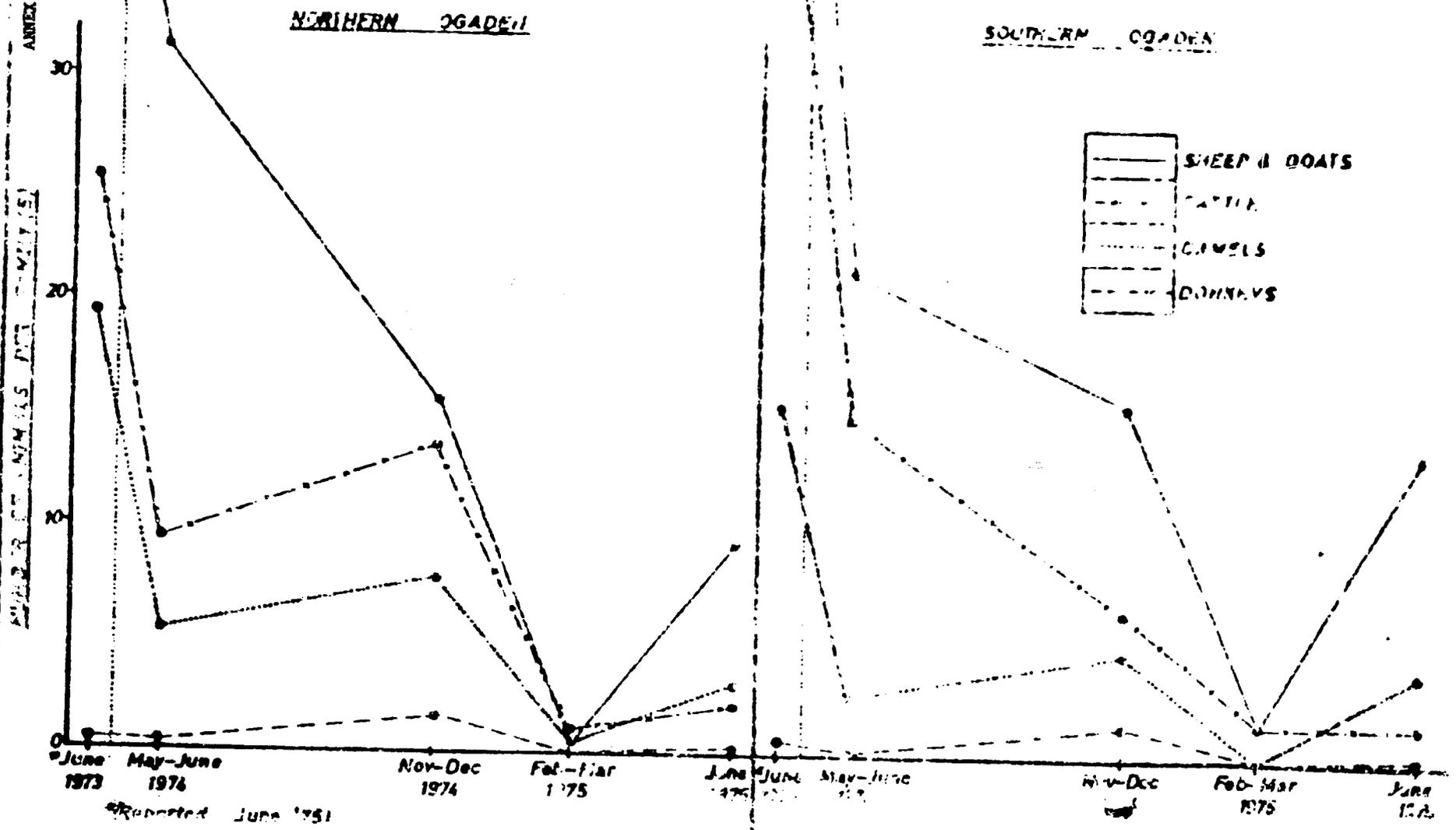
	June 1973		June 1973	
	(Reported in June 1975)		(Reported in June 1974)*	
	Nth	Sth	Nth	Sth
Cattle	25.4	39.4	25.3	41.8
Goats and Sheep	85.5	82.9	108.6	55.1
Camels	19.3	15.3	13.2	7.1
SSU/family	23.9	26.5	21.1	21.3

The changes in animal holdings observed since that time reflect not only the effects of the drought, but probably other factors as well. It is clearly not possible that between February and June 1975 herd size could have increased to the extent indicated by normal regenerative processes. The low figure reported in February was probably a result of under-reporting, of migration by men and older boys out of the Ogaden with most of the remaining herd and of a poor selection of the sample. At best these figures should be interpreted as indicating the number of animals left with remnants of families in the Ogaden. Many sought and found food from the government relief programme. Since February, there has been an observable migration back into the area (as is normal after the main rains in April and May) but mean holdings are still reported to be below the 'survival minimum' of 7.5 SSU per family.

Losses may also be partly accounted for by off-take for marketing. Little is known about the changes in off-take rates during times of scarcity. It is probable that this is a very complex matter dictated by pastoralist expectations, the level of hardship. The fall-off in milk production, the rate of animal mortality and the prices being offered.

* Calculated from "Harraghe Under Drought" (RRC) data.

AVERAGE LIVESTOCK HOLDINGS PER FAMILY (5 BY TYPE OF ANIMAL) (1973-1975)



AVERAGE LIVESTOCK HOLDING / FAMILY (5) IN STANDARD STOCK UNITS (SSU)

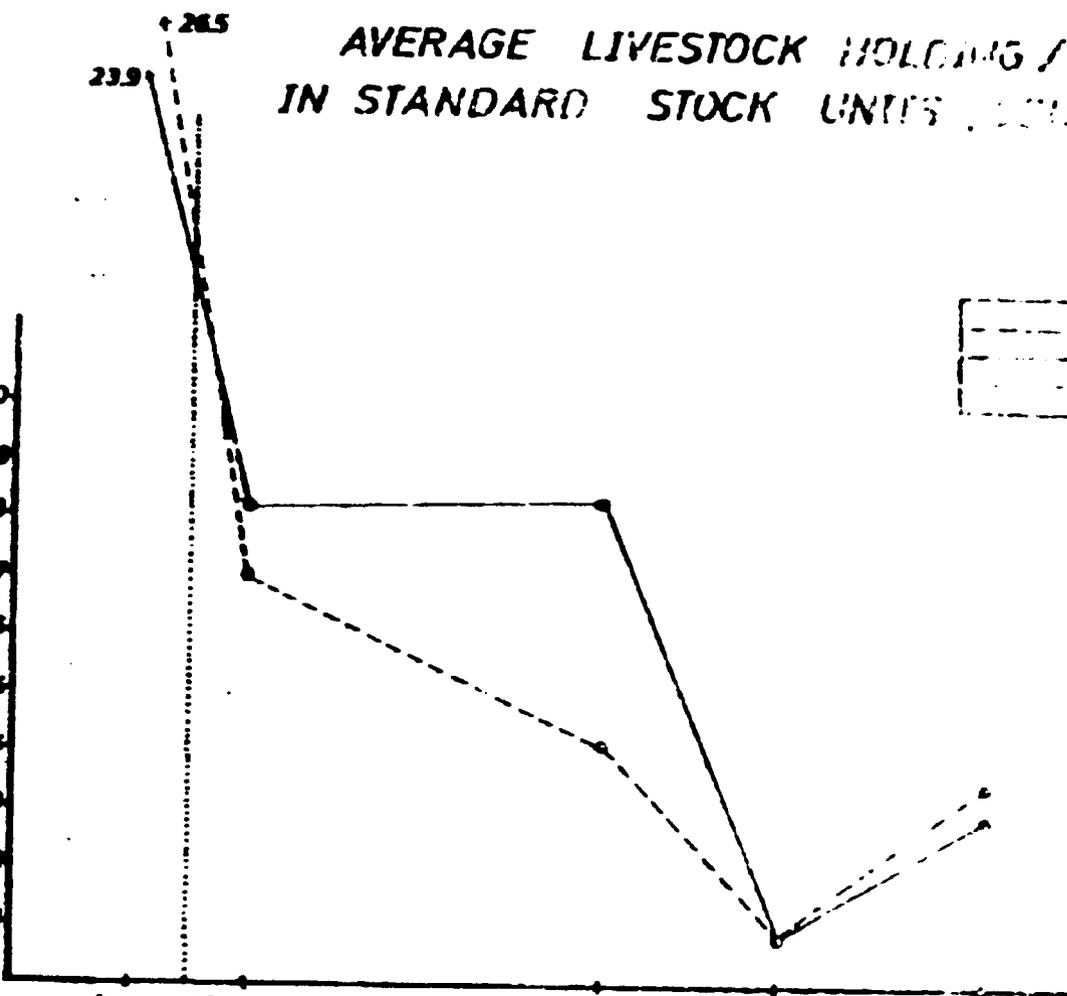
STANDARD STOCK UNITS (SSU)/FAMILY

10
9
8
7
6
5
4
3
2
1

--- NORTHERN OGADEY
- - - SOUTHERN OGADEY

June 1973 May-June 1974 Nov-Dec 1974 Feb-Mar 1975 June 1975

23.9
26.5



The most obvious and most serious losses have occurred among the cattle of the area although sheep and goats have also been affected. If the February - March level is ignored, the camel losses have been much less extensive; this, of course, is to be expected.

The increase in animal numbers observed in the Northern Ogaden during the November - December survey may be explained by an exaggerated but usual northward migration which occurred between June and December. Regretably many of these animals were lost due to a combination of over-grazing and a failure of the November - December rains. While congregated in river valleys just south of the highlands.

The final result of the drought on the animal population can be seen from the fact that mean holding size is well below the minimum required for survival. On the basis of this information a number of years will elapse before the herd size will attain proportions required to support the present population of the area should they retain a pastoral way of life.

Market Prices

Prices for two grains - sorghum and maize - and for animals compared with pre-drought prices for the area (base index 100) are shown in Figure V. The actual prices are shown in Table II. These figures have been derived from direct observations in all accessible markets in the area and the results averaged.

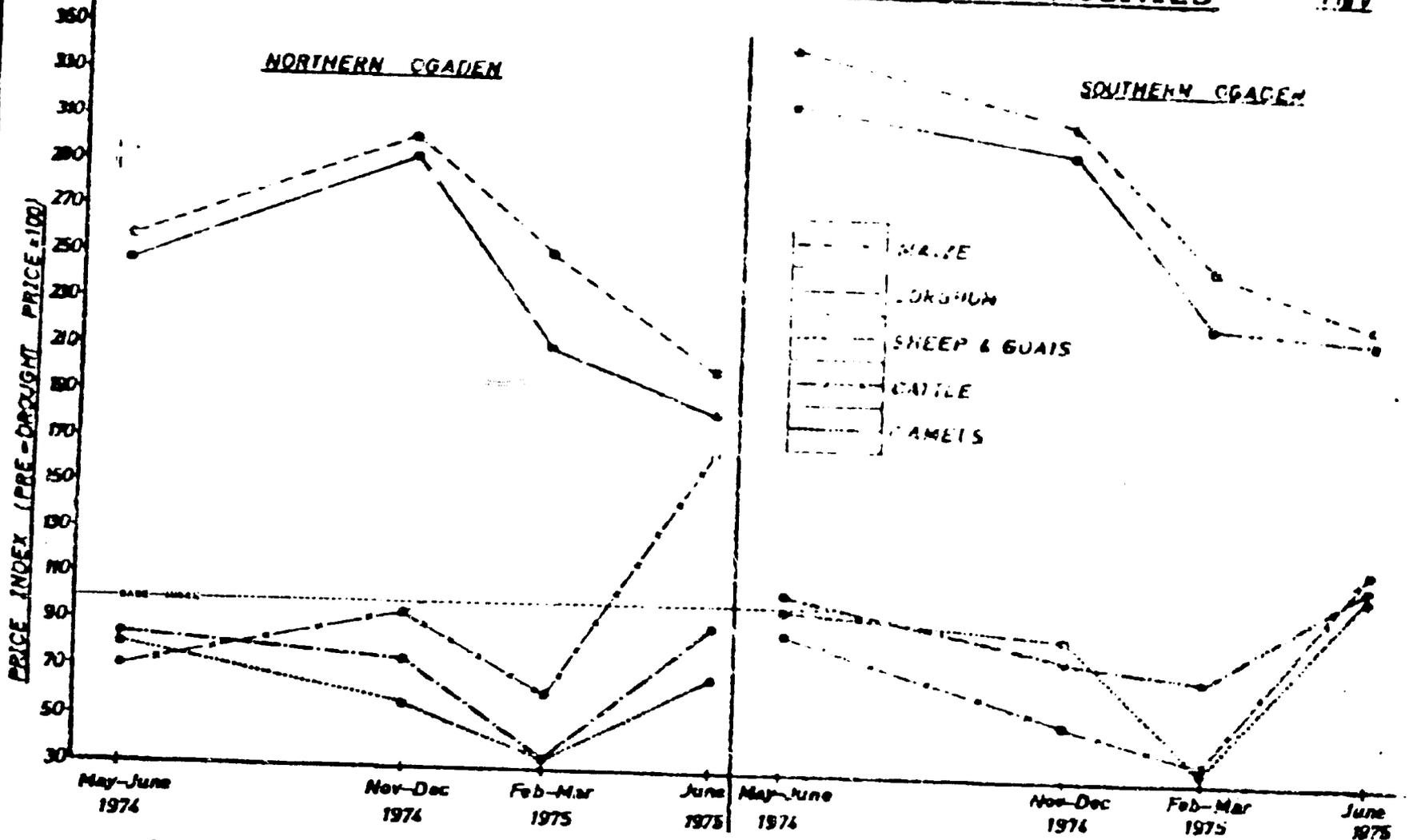
1. Grain Prices

Throughout the period prices have been unusually high. The partial failure of the highland crop in 1974 caused severe shortages of grain in the Ogaden, particularly in the south. We have no information regarding the balance of effect on demand caused by reduced purchasing due to scarcity of animals and low animal prices on one hand and a shortage of animal products for food on the other.

During 1975 grain prices have fallen considerably - more so in the Northern Ogaden which is closer to supply from the highland and which in general has 'recovered' more rapidly than the south. Even in the Northern Ogaden, however, grain prices are still running at twice their pre-drought levels.

PRICE INDEX for ANIMALS & FOOD COMMODITIES*

FILE



*Mean selling price for grain, & ing price for animals in local market

2. Animal Prices

Throughout 1974, animal prices were exceptionally low and at one point around the turn of the year after the failure of the end of year rains, marketing virtually ceased. This year recovery has taken place. In the south, all animal types are being bought at pre-drought prices while in the north cattle are actually being bought for one and a half times their pre-drought value. No comparative information is available regarding the flow of animals through local markets but we would suspect that this has not yet achieved normal levels. It is probable, therefore, that the rise in price during the last six months is as much due to excessive demand over supply as due to a complete recovery of the animal economy. This indicates a disruption of food supply but in addition it should be noted that throughout, the pastoralists have operated in an adverse market situation - low animal prices, high grain prices - this adding to their hardship.

Nutritional Status

The results of the four surveys are shown in Figure VI and in Table III, the latter indicating the distribution of results about the mean. It will be seen that a significant deterioration in the nutritional condition of the population took place in the second half of 1974. It is probable that the lean time brought about by the long dry period between the main rains results in a 'deterioration' in nutritional status normally which is no more than a physiological adaptation to relative food scarcity but the proportion of severely malnourished children doubled between June and November 1974. There was a further deterioration in the south between December 1974 and March 1975.

The recovery shown in the June - August results in undoubtedly an expression of increased animal production as a result of the April - May rains. The effect of the government relief operation may also have contributed but it should be noted that the measurements obtained for the June - August report did not come from relief centres but from settlements and encampments in the interior. The recovery in the south has been less dramatic than in the north where mean nutritional status is now significantly better than at the same time in 1974. Despite these encouraging results, two points should be noted. Table III shows that in both the north and the south the proportion of severely malnourished children (70% of standard weight-height) is twice as great as at the same time in 1974. In addition the mode point still lies between 80 and 89% of standard which is too low for unqualified complacency.

NUTRITIONAL AIDS

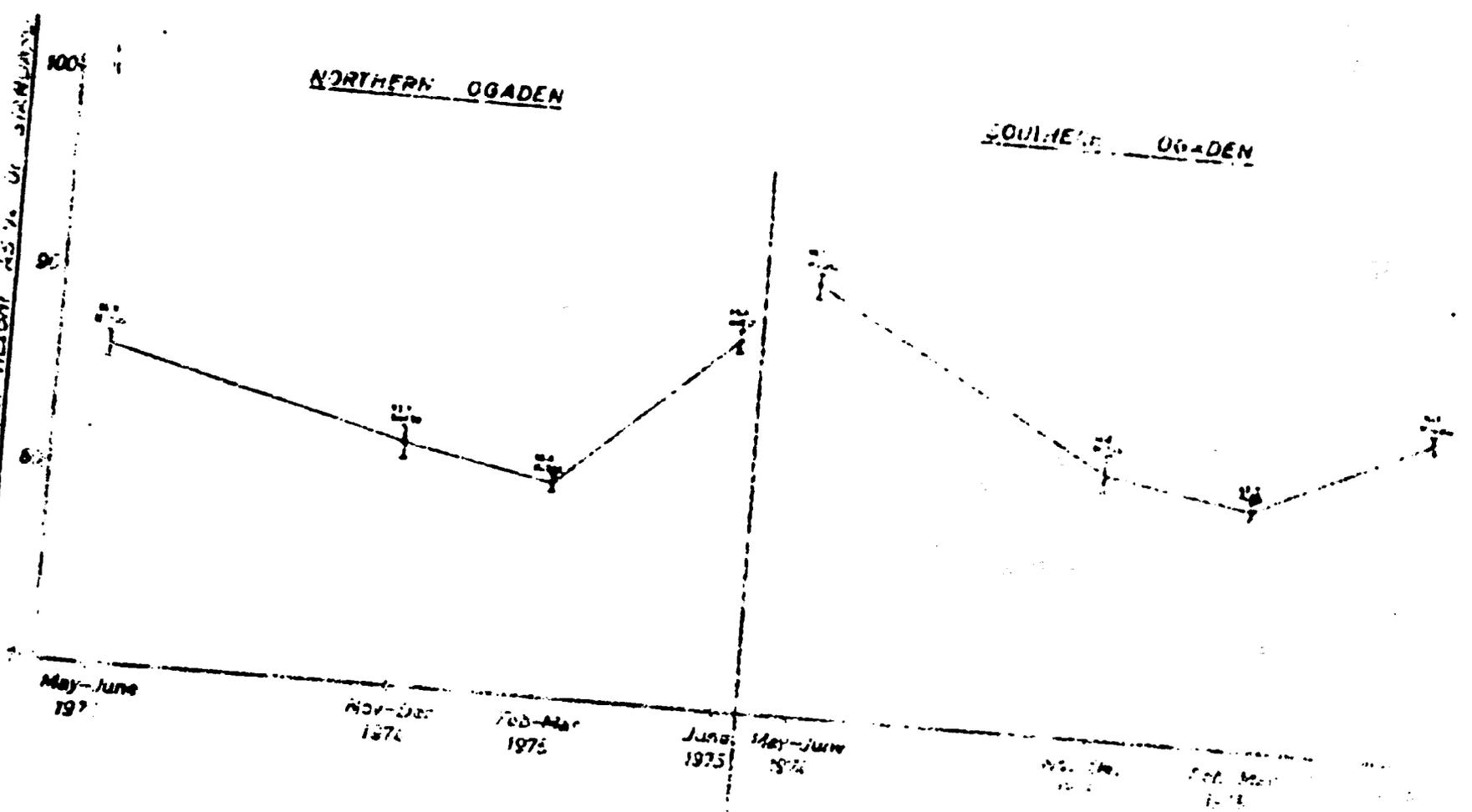
WEIGHT FOR HEIGHT AS % OF STANDARD OVER TIME
(MEAN VALUE STANDARD DEVIATION OF THE MEAN)

MEAN WEIGHT-HEIGHT AS % OF STANDARD

100
90
80

NORTHERN OGADEN

SOUTHERN OGADEN



May-June
1974

Nov-Dec
1974

Feb-Mar
1975

June
1975

May-June
1976

Nov-Dec
1976

Feb-Mar
1977

TABLE II

Mean Market Prices by type of Commodities

(Eth. \$/quintal or /head)

Time	Northern Ogaden					Southern Ogaden				
	<u>Sorghum</u>	<u>Maize</u>	<u>Cattle</u>	<u>Sheep & Goats</u>	<u>Camels</u>	<u>Sorghum</u>	<u>Maize</u>	<u>Cattle</u>	<u>Sheep & Goats</u>	<u>Camels</u>
May-June '74	42	36	62	18	193	51	48	77	19	223
Nov-Dec '74	49.8	42.1	83.0	16.0	132.5	48.0	43.8	46.3	14.5	201.7
Feb-Mar '75	36.3	35.3	32.2	13.1	77.9	36.3	35.3	32.2	13.10	77.90
June '75	31.3	28.5	146.3	19.1	168.3	35.5	32.1	104.4	20.7	247.7
Pre-drought Year	17	14	87	21	238	16	14	86	18	222

TABLE III

Nutritional Status

Frequency Distribution of % Weight for Height

NORTHERN OGADEN

<u>% Standard</u>	<u>May-June '74</u>	<u>Nov-Dec '74</u>	<u>Feb-Mar '75</u>	<u>July-Aug '75</u>
100	10.5%	5.15%	1.6%	18.9%
90-99	23.0%	18.47%	11.9%	20.0%
80-89	41.3%	37.22%	41.0%	35.8%
70-79	21.9%	30.68%	38.0%	19.4%
70	3.3%	7.95%	7.46%	5.9%
	$\bar{X} = 86.54$ SD = 9.71 n = 305	$\bar{X}_0 = 82.70$ SD = 9.99	$\bar{X} = 80.91$ SD = 8.58 n = 563	$\bar{X} = 85.94$ SD = 14.03 n = 609

SOUTHERN OGADEN

100	24.0%	4.41%	2.62%	12.15%
90-99	33.9%	18.56%	16.07%	20.10%
80-89	29.5%	44.73%	38.36%	35.84%
70-79	9.9%	26.84%	35.41%	24.89%
70	2.7%	5.43%	7.54%	7.01%
	$\bar{X} = 92.15$ SD = 11.54 n = 292	$\bar{X}_0 = 53.50$ SD = 9.05	$\bar{X} = 82.15$ SD = 8.31 n = 610	$\bar{X} = 86.27$ SD = 13.36 n = 1169

These data indicate that while there has been a general and encouraging improvement in nutritional status since February, a significant proportion of the population at large are still showing signs of under nutrition.

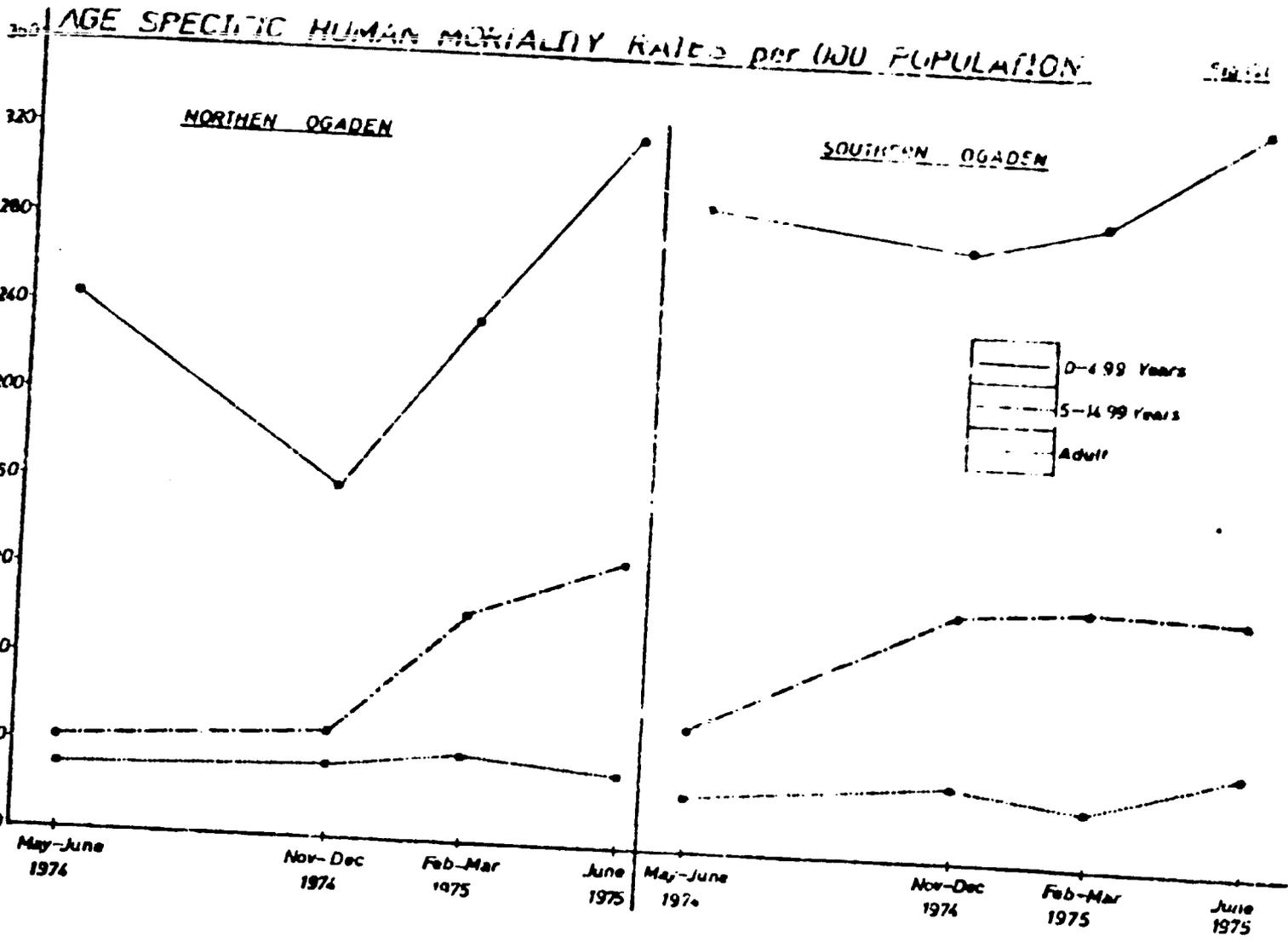
It should also be remembered that June is probably the most abundant time of the year in the Ogaden. The population of the south have not recovered their 1974 condition. There has been further depletion of animal resources in the entire area. A considerable number of people are now dependent on relief grain. Thus, if the population was vulnerable to disturbance of end - year rains in 1974, it is equally or more so in 1975.

Human Mortality

As has been said, mortality rates provide only a crude retrospective index of the severity of the drought in human terms. No reliable 'normal' age specific mortality rates exist for this area. Our findings are summarized in Figure VII. In interpreting these data and comparing the results with the sequence of events it should be remembered that the results relate to the previous twelve months and not to the time indicated. Thus, the high levels recorded in June 1975 are a synopsis of events between that time and June 1974. The evidence would indicate that the greatest death rate occurred in the Ogaden between November 1974 and February 1975.

It is significant that the reported under-five mortality rate in the Southern Ogaden has remained high throughout the period. This is traditionally regarded as the most vulnerable group (although there is evidence to suggest that in pastoral societies this may not be so). In the north, under five mortality between November 1973 and 1974 was lower than in other periods; this level probably approximates to normal and suggests that the higher level reported in June 1974 was caused by deaths before November 1973. Since November 1974, mortality rates have climbed steeply but those reported in June 1975 are almost certainly repeated reportings of deaths occurring before the beginning of the long rains in April.

It should be noted that the severity of the famine began to bite into those less vulnerable (the 5-15 age group) and rather earlier in the south than the north. This conforms to other evidence that the effects of the drought have been more severe in the south - which is in any case ecologically and climatically more vulnerable - and with the exception of the pastoralists who congregated along river valleys, the population in the north survived rather better than their neighbors in the south.



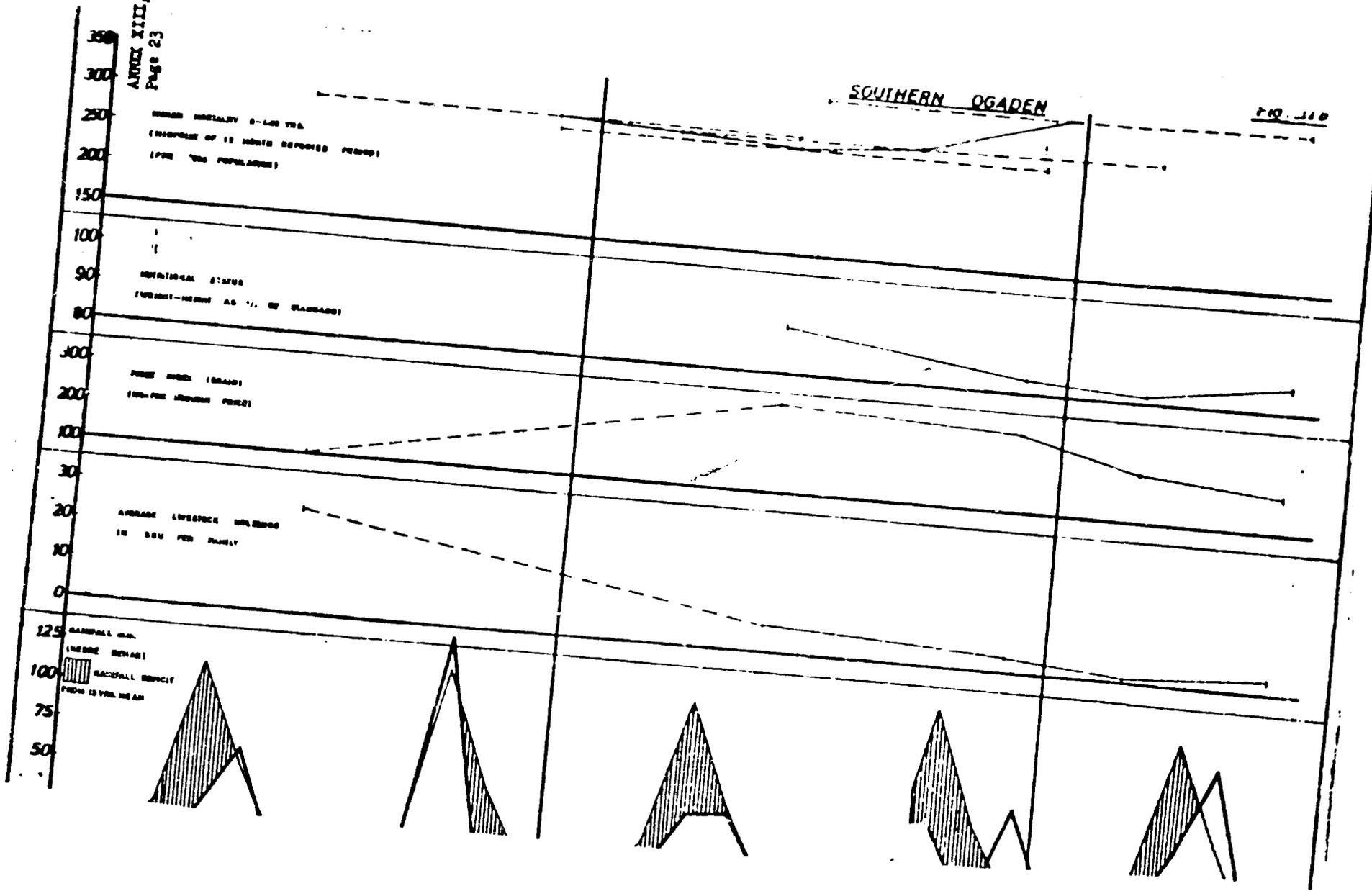
Summary and Recommendations

The picture we have painted, particularly in this last section, is a gross over simplification. The pastoralists mobility makes nonsense of 'north' and 'south' as self-contained areas although most clans have 'home' settlements from which they move. What is more important is the concept these reports give of the inter-relationships of the changes which have occurred in the last twelve months namely loss of livestock, particularly cattle (a resource which is not replaced quickly), the increasingly adverse market trends, the deterioration in nutritional status of the population reflecting the scarcity of food and the tragic consequences of human death (Figure VIII a & b). It is our impression that such is the social structure of the Ogaden Somalis, adopted as it is to withstand scarcity and hardship, the effects of drought are not obvious until a 'flash point' is reached when all mechanisms to buffer adversity are finally exhausted. It seems that only those who were able to make their escape from the area - usually leaving behind their women and children - were able to retain enough livestock to have any chance of continuing a pastoral way of life. We still do not know accurately how many families have enough animals to survive and how many do not, but all the evidence points to the fact that urgent, imaginative and broadly based rehabilitation and development policies are required in the area.

These must be directed towards conserving the remaining livestock, assessing realistically the capacity of the area to carry animals, establishing sound rangeland management and marketing practices and most important of all establishing the size of the population left without a viable means of survival. In consultation with the clans involved, a long term solution to the problems of this area must be found and implemented. In common with other lowland pastoral areas, the Ogaden presents a challenge to us all.

SOUTHERN OGADEN

FIG. 110



ANNEX XIV

STATUS AND RELATIONSHIP OF EXISTING GOVERNMENT SERVICES

The existing Government instruments that will be active in the EWS and their current activities and relationships to the EWS include the following:

Meteorology

Climate determines natural vegetation, abundance or lack of fresh water, agricultural possibilities and suitability of location of human habitation, and the weather determines the most economic operation of dams, the best period for carrying out various farming operations, the comfort and safety of different types of transportation, etc. In short, weather and climate affect almost all our social and economic activities.

It is generally recognized that adequate meteorological information reduces unnecessary expenditure, helps to avoid waste of national resources and is a must both at the planning and operational stages of many development programs.

Technology

Meteorology and Water Resources Development:

Water is a very important natural resource. Ethiopia is blessed with abundant water wealth. The development of a basis is, in many instances, for multi-purposes which combines hydropower production, irrigation agriculture and flood control. Management of such a scheme becomes a very complicated matter. The interest from the power production point is to maintain enough water in the reservoir so that the power production will not be hindered during the dry periods. On the other hand the farm projects in the flood plains, which usually cover a good portion of the irrigable lands, are interested in controlling floods. This would mean emptying the reservoir to accommodate the flood. For maximum utilization enough water must be retained in the reservoir to be used for irrigation purposes during the dry months. It is clear that the demands of the different activities can often be in conflict. Such seemingly conflicting demands, however, could be brought together and the varied interests reasonably satisfied with a well developed management technique which must include forecasts and advices of weather and climate. The Avash valley development is such an undertaking.

The Hydro-Meteorological Service of the Civil Aviation Administration, though still in its infancy, is rendering a valuable assistance to individuals, private organizations and to Government agencies. Hundreds of rainfall and higher class meteorological stations have collected weather reports for several years. These are used for the assessment of water resources and for the planning of water use of the country. Such information assists engineers in the design of city drainage systems, dams, highways, culverts and airports drainage facilities. The importance of meteorology is realized in all such works where safety and economy are of paramount importance.

Meteorology and Agriculture:

The relationship between weather and climate and agricultural activities is self-evident. Different crops have different climatic requirements. Highwinds, frost, hail, drought, flood, untimely rain, etc. affect plants in their different stages of development. These influences are quite prevalent in this country. The development and spread of plant diseases and insect pests is highly controlled by weather and climate. Therefore, in an attempt to rapidly improve agriculture and forestry meteorology is a very important component without which valuable time as well as resources will be lost. The following general areas show the role meteorology plays:

- In the choice of crops, animals and husbandary methods, it will give an immediate impetus to agricultural development and transform past farm losses to profits.
- In the determination of farmable times to sow, make hay, and gather crops.
- In the provision of shelter from wind and drifting sand, or protection against frost.
- In the planning of afforestation and irrigation to supplement deficient rainfall or to increase crop output and profit.
- In the control of locust. As moisture stimulates hatching and swarms movements depend on wind, meteorology plays an important role in the fight against desert locust.

Some meteorological services in the developed countries have determined the value of meteorology for each sector of the economy by using the benefit to cost ratio (the benefits obtained to the amount spent for the meteorological service) for these activities that can be assessable. Experts have reached general agreement that this benefit to cost ratio is approximately 20:1 (agriculture 100:1, Aviation 10:1).

Since Ethiopia is basically an agricultural country most of the requests for meteorological information and advice are for agricultural development planning and for forestation programs. The number of requests from individuals, private organizations and Government agencies is growing at a fast rate. As more farmers and agricultural projects realize the benefit they can gain from meteorology, weather forecasts and specific advice for such activities as frost protection, irrigation, sowing, harvesting and for design shelter belts and wind breaks, etc. will be increasingly demanded.

Available Data:

Very few stations have reports covering the minimum 30 year period necessary to establish meteorological "norms".

The meteorological service at present is supported by 400 reporting stations; of these, 35 are "class I" stations, 20 are "class II", 45 are "class III" and 300 are "class IV". Class I stations record a wide variety of meteorological information - soil temperatures, air temperature and humidity, rainfall, evaporation, sunshine duration, wind speed and direction and weather phenomena. At the other end of the scale "class IV" stations make rainfall observations only.

Crop Reporting:

Technology

It is possible to predict the outcome of a harvest with increasing accuracy as the crop season progresses. The prediction of the effects of climatic conditions and other influences on agricultural production can be translated into reality with the assessment of actual production. Information in the following general categories identify stages in the crop calendar which are of significance:

- land preparation
- seed and labor availability
- crops planted
- the progress of crop growth and maturation
- the presence and damage caused by pests and weather hazards
- and assessment of yield at the time of harvest.

Deviation from the "norm" in any of these categories of information indicate with greater or lesser precision the possibility that crop production for an area will be less than expected. While baseline data is

in some cases lacking and precise relationships require definition the record of crop progress throughout the year coupled with the actual assessment of crop yield will indicate the likely and actual food availability in areas dependent on crop cultivation.

Available Data:

No regular national reporting system exists for the assessment of crop performance or yield. The meteorological service has attempted to gather regular pheno-biological observations since 1971 but only a few stations have continued them. The Ministry of Agriculture carried out a number of surveys during the harvest period to assess qualitatively crop yields in various parts of the country. These, over the last three years have constituted a "regular" qualitative report on the national crop situation. In addition, the Ministry's Planning and Programming Division is developing plans based on a series of pilot quantitative crop cutting surveys to establish a means of measuring national crop production.

EPID is active in data gathering activities in areas served by Minimum Package Programs. These include (a) a crop survey from randomly selected centers, including quantitative assessment of yields; (b) a survey of agricultural inputs in MPP areas; (c) a quarterly report from field supervisors (these reports include disease and pest outbreaks and market prices); and (d) coordinators reports every two months.

No reliable "average" production figures are available below a national level. Thus no comparisons can be made at a Woreda or Awraja level. We believe that this level of discrimination is required if localized areas of shortage and surplus are to be identified.

Livestock:

Technology

Livestock, apart from being an important source of protein for the country at large, are a major source of food and income for more than two million people living in pastoral areas of Ethiopia. Animals also provide an important source of power in cropping areas. Therefore, the assessment of factors which determine livestock health, feed and the assessment of herd size is an important activity in the overall assessment of the food supply system. A realistic picture of the livestock situation will be obtained by taking into account range conditions including water availability, livestock population, herd/flock composition, fertility, mortality and offtake rates, age of first calving and slaughtering rates.

Available Data

There is no regular reporting system on livestock production although twelve of the fourteen provinces have been surveyed to establish livestock populations, production, market prices and a number of other categories of relevant information. Livestock and Meat Board has also studied various livestock development projects which are ready for implementation in rangeland areas.

Livestock population by animal type are available at Awraja level for 12 of the fourteen provinces. This information was obtained by interviewing farmers' representatives and officials from each of the Woredas in the respective provinces. It does not agree well with the results of other more limited surveys but stands as the most complete survey of the country's livestock production.

The regular reporting of pasture and water conditions and the livestock situation together with information which will indicate any change in the pattern of movement of the pastoralists and any outbreak of any livestock diseases should form an important part of a comprehensive reporting system on food supply in rural Ethiopia.

Market Information:

Technology

Classical economic theory states a relationship between supply, demand and market prices. Market prices provide valuable information regarding the changing balance between production and demand and assist in the identification of areas of surplus and of deficit food production.

Although more precise information required regarding the behaviour of rural grain markets in times of shortage it would appear that surplus supply is reflected in falling prices. During periods of shortage, it would appear that the market system breaks down relatively early due to a fall in purchasing power. Prices may therefore not rise very much. At the same time a number of market systems operate together in rural areas. If buyers and sellers and the prices which link them are carefully identified it may be possible to discriminate between different "market" systems and improve the value of grain price data as experience is accumulated. The usefulness of price data will be reviewed as experience is gained.

Available Data

In Ethiopia although a certain amount of information exists regarding the market structure and its response to supply and demand variations, the coverage could be further improved. Livestock prices have been collected by the LMB from important animal markets over the last four years for each animal type. Grain prices have been collected variously by the Ethiopian Grain Corporation and the Ethiopian Commercial Bank from eight major grain markets. These prices are wholesale prices in general. Records extend back for about ten years. The inclusion of market information will provide information which cannot be obtained in any other way, and once further experience is gained, may be a valuable predictive indicator which will aid in the identification of areas where the level of shortage reaches a point at which the community is affected by it.

Livestock Markets:

Information gathered on a regular basis will identify for each market its supply and consumption regions, the purpose of sales, the prices and weights of different classes of animals, the types of buyers and sellers to name a few important areas of information. The importance of this information is underscored by the fact that it provides data which livestock and range assessment does not.

In addition in markets where animals are exchanged for grain this exchange has a direct bearing on the food supply of pastoralists.

Nutrition*:

Technology

The assessment of stocks of food held by a family is particularly valuable in cropping areas where the one or perhaps two harvests of the year provide the major source of food for the family. The quantity stored depends on the level of production and the family's expectations for their next supply of staple food. Thus if two months after a harvest there is only food for another three months, but the next harvest is five months away, this is clearly valuable predictive information that a two month lean period is likely. As in many areas surplus food is sold for cash, the flow of food from subsistence agriculturalists provide an indirect indicator that the family's food requirements had been met by harvest production and that there is surplus to sell.

* Demographic data relates to a number of fields -- for example livestock and nutrition.

The measurement of dietary intakes gives information which is immediately predictive of nutritional status. As such it provides a valuable adjunct to nutritional status measurements in that even if nutritional status is poor, provided dietary intakes are good, improvement can be expected. The reverse also applies.

The measurement of nutritional status indicates the combined effects on the individual of inadequate food intake and associated diseases which accompany famine. Observations in Ethiopia and elsewhere indicate that children (because of their relatively high nutrient requirements) are more sensitive to the effects of food and/or water shortage than adults.

Available Data

A number of background studies have been made by the ENI on food eaten, dietary intakes and nutritional status of a number of groups within the country. Regular reporting on nutritional matters has been part of the ENI activities since 1963 and has achieved special significance since August 1973. This activity is ongoing as part of the Consolidated Food and Nutrition Information System.

Health:

Technology

In food and/or water shortage situations there is a direct relationship between under-nutrition and disease. They have a combined effect on the morbidity rates within the population. While death is the last and final event in the severe food and/or water shortage situation, mortality rates signify most accurately the profundity of a crisis food and/or water shortage situation. Because disease rates tend to be high when nutritional status is low the collection of morbidity statistics provides important information for the planning of response in situations of food disaster.

Available Data

There is no registration of births and deaths in the country since the birth and death rates used in health statistics are just estimates. So is the case with the infant mortality rate.

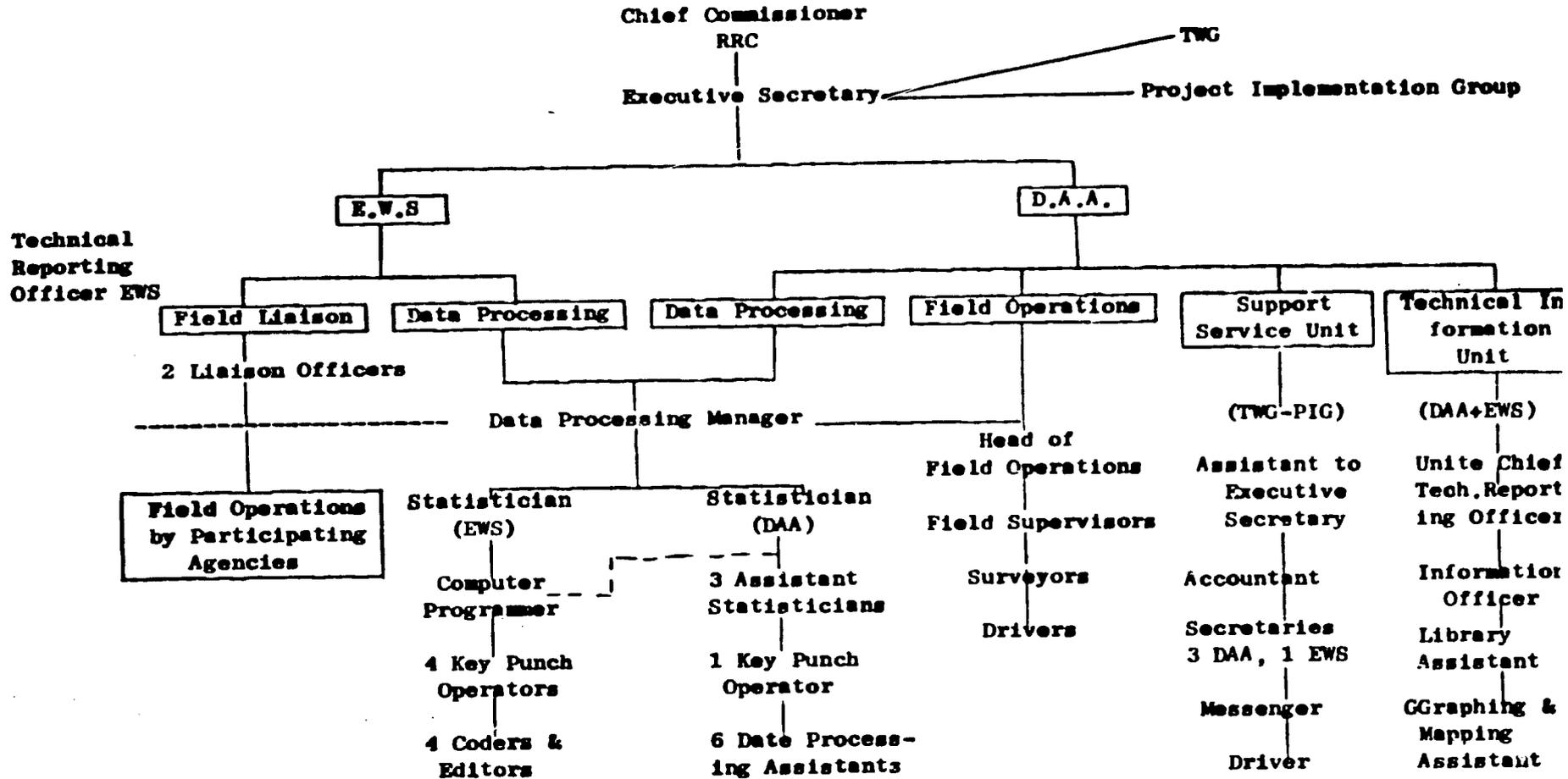
There is a regular reporting of the "total morbidity" coming from the health centers and hospitals, at monthly intervals to the Ministry of Public Health, based on the number of patients who had been given some services in these health institutions.

There is a weekly reporting of some selected communicable diseases coming from health centers to the Epidemiology Division of the Ministry of Public Health with considerable delays.

No comprehensive baseline data exists on disease patterns or morbidity rates. A number of studies have been done -- mainly by the Faculty of Medicine, National University -- which provide information on a few selected areas but variations within the country make it unlikely that this information can be applied generally. The Ministry of Public Health has information which is relevant to large towns and cities in the country but these do not purport to have relevance to all rural areas. Information collected in other countries, while providing crude guidelines as to mortality rates and the incidence of diseases which might reasonably be expected, clearly cannot be applied in detail to individual areas within Ethiopia.

TECHNICAL INFORMATION SERVICE - RRC

ORGANIZATION CHART
(Drought Area Assessment and Early Warning System Combined)



NUTRITION/HEALTH EARLY WARNING SYSTEM(INCLUDING DROUGHT AREA ASSESSMENT)Illustrative Master Budget Summary 1/

		Eth. \$
A. Secretariat - RRC		Equipment
Salaries and per diem	94,444	
Personnel services	28,800	
Non-personnel services	157,000	10,000
Miscellaneous	<u>10,000</u>	
Sub-Total	<u>\$290,244</u>	
B. Drought Area Field Operations - RRC		
Salaries and per diem	172,704	
Personnel services	-	
Non-personnel services	120,000	50,000
Miscellaneous	<u>20,000</u>	
Sub-Total	<u>\$312,704</u>	
C. Statistics & Data Processing Unit - CSO		
Salaries and per diem	116,920	
Personnel services	7,200	
Non-personnel services	79,080	
Miscellaneous	<u>10,000</u>	
Sub-Total	<u>\$213,200</u>	
D. Crop Assessment - MOA		
Salaries and per diem	350,250	
Personnel services	75,620	
Non-personnel services	120,000	
Miscellaneous	<u>10,000</u>	
Sub-Total	<u>\$558,870</u>	

* US\$ 1 = Eth.\$2.05447

1/ Anticipated first year operations - exclusive of MOPH/WHO.

		<u>Equipment</u>
E. Market and Pastoral Assessment - LMB		
Salaries and per diem	256,230	
Personnel services	12,400	
Non-personnel services	165,300	91,500
Miscellaneous	<u>20,000</u>	
Sub-Total	<u>\$453,930</u>	
F. Nutrition Assessment - ENI		
Salaries and per diem	152,350	
Personnel services	15,900	
Non-personnel services	150,300	60,000
Miscellaneous	<u>10,000</u>	
Sub-Total	<u>\$328,550</u>	
G. Climate Assessment		
Salaries and per diem	131,492	
Personnel services	12,000	
Non-personnel services	578,500	350,000
Miscellaneous	<u>25,000</u>	
Sub-Total	<u>\$746,992</u>	

TECHNICAL INFORMATION SERVICERELIEF & REHABILITATION COMMISSIONMASTER BUDGET FOR EARLY WARNING SYSTEM AND DROUGHTAREA ASSESSMENT PROGRAM

A. SECRETARIAT

Salaries and Per Diem

Executive Secretary	Salary	1100/m	1	13,200
	Per diem	18/d	100d	1,800
Administrative Assistant	Salary	750/m	1	9,000
Accountant	Salary	550/m	1	6,600
	Per diem	16/d	100d	1,600
Technical Reporting Officer	Salary	900/m	1	10,800
Head of Technical Information Unit	Salary	880/m	1	9,600
	Per diem	18/d	100d	1,800
Information Officer	Salary	750/m	1	9,000
Graphing & Mapping Assistant	Salary	475/m	1	5,700
Secretaries	Salary	675/m	1	8,100
Driver	Salary	580/m	2	13,920
Messenger	Salary	182/m	1	2,184
	Salary	95/m	1	1,140

94,444

Personnel Services

Internal travel for secretariat staff and professional staff from participating agencies	200/m	12	28,800
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28,800

Non-Personnel Services

Office maintenance	Salary	500/m	6,000
Supplies and Equipment			
Printing Costs			75,000
Production of Technical Documents			60,000
Equipment			10,000
Library Fund			6,000
Miscellaneous			157,000
Sub-Total			10,000

\$290,244

B. DROUGHT AREA FIELD OPERATIONS

Head of Field Operations	Salary	700/m	1	8,400
	Per diem	18/d	200d	3,600
Senior Supervisors	Salaries	550/m	3	19,800
	Per diem	16/d	3/300	14,400
Surveyors	Salaries	275/m	18	59,400
	Per diem	10/d	18/200	36,000
Drivers	Salaries	182/m	6	13,104
	Per diem	10/d	6/300	18,000
				<u>172,704</u>

Personnel Services Nil

Non-Personnel Services*

Supplies & Equipment				50,000
Equipment (capital)				10,000
(replacement)				60,000
Supplies & Maintenance	5,000/m			<u>120,000</u>
Miscellaneous				<u>20,000</u>
Sub-Total				<u>\$312,704</u>

* Vehicles maintenance & fuel provided by RRC.

C. STATISTICS AND DATA PROCESSING UNIT - CSO

Salaries & Per Diem

Statistician	Salary	900/m	1	10,800
	Salary	600/m	1	7,200
	Per diem	16/d	100d	1,600
Data Processing Manager	Salary	900/m	1	10,800
Assistant Statisticians	Salary	450/m	3	16,200
Computer Programmer	Salary	800/m	1	9,600
Key Punch Operators	Salary	300/m	5	18,000
Data Processing Assistants	Salary	260/m	6	18,720
Coders & Editors	Salary	300/m	4	14,400
Computer Operator (Part-time)		10/hr.	360 hr.	3,600
Secretary	Salary	500/m	1	6,000
Sub-Total				<u>\$116,920</u>

Personnel Services

Internal Travel	200/m	3	<u>7,200</u>
			7,200

Non-Personnel Services

Office Maintenance	500/m		6,000
Computer Supplies			
96 Col Cards	15/ea	100 bx	1,500
Printout Paper	45/ea	12 bx	540
Computer Component Rental			
Software	90/m		840
Core Storage (32 K)	3,500/m		42,000
Graph Plotter	250/m		3,000
Punch - Verifiers (rental)	420/m		<u>25,200</u>
			79,080
Miscellaneous			<u>10,000</u>
Sub-Total			<u>\$210,800</u>

D. CROP ASSESSMENT

Salaries & Per Diem

Reporting Agents	Salary	275/m	80	264,000
	Hardship Allowance	30%		66,000
Drivers	Salary	225/m	6	16,200
	Hardship Allowance	30%		<u>4,050</u>
				350,250

Personnel Services

Internal Travel (Field Reporters)			<u>78,620</u>
			78,620

Non-Personnel Services

Office Rental	50/m	60	36,000
Office Maintenance	50/m	80	48,000
Vehicles' Fuel & Maintenance			<u>36,000</u>
			120,000
Miscellaneous			<u>10,000</u>
Sub-Total			<u>\$558,870</u>

E. LIVESTOCK MARKET AND PASTORAL ASSESSMENT* LMB

Salaries & Per Diem

Coordinator	Salary	900/m	1	10,800
	Per diem	18/d	100d	1,800
Regional Supervisors	Salary	450/m	4	21,600
	Hardship Allowance	50%		6,480
Reporting Agents	Salary	275/m	15	49,500
	Hardship Allowance	30%		14,850
Market Reporters	Part-time	60/m	150	108,000
Assistants	Casual	12/m	300	43,200
				<u>256,230</u>

Personnel Services

Internal Travel		200/m	1	2,400
Training				<u>10,000</u>
				12,400

Non-Personnel Services

Field Office Rental		80/m	20	19,200
Field Office Maintenance (includes postage, stationary, etc.)		80/m	20	19,200
Local Transport		30/m	15	5,400
Fuel & Maintenance (vehicles)				30,000
Equipment				
Office Furniture		150/ea	20	3,000
Scales Tapes, Pasture Assessment etc.		350/ea	150	50,000
Camping Equipment				20,000
Fencing Materials				6,500
Motor Cycles		3,500/ea	4	12,000
				<u>165,300</u>
Miscellaneous				<u>20,000</u>
Sub-Total				<u>453,930</u>

* To be coordinated with other programs: ILCA/LMB
IBRD/LMB etc. See Annex XVII, IBRD Crop Storage and
Marketing.

F. NUTRITION ASSESSMENT - ENI

Salaries and Per Diem

Coordinator	Per diem	20/d	120d	2,400
Senior Supervisors	Per diem	20/d	2/120d	4,800
Regional Supervisors	Salary	450/m	5	27,000
	Hardship Allowance	30%		9,000
Reporting Agents	Salary	275/m	20	66,000
	Hardship Allowance	30%		22,000
Drivers (field)	Salary	225/m	5	13,500
	Hardship Allowance	30%		4,050
Drivers	Per diem	15/d	2/120	3,600
				<u>152,350</u>

Personnel Services

Internal Travel		30/m	30	10,800
Clothing Allowance				2,100
Insurance				<u>3,000</u>
				15,900

Non-Personnel Services

Field Office Rental		60/m	25	1,500
Office Maintenance		100/m	25	30,000
Fuel and Maintenance		700/m	7	58,800
Equipment				
Vehicles		30,000/ea	2	<u>60,000</u>
				150,300
Miscellaneous				<u>10,000</u>
Sub-Total				<u><u>\$328,550</u></u>

G. CLIMATE ASSESSMENT - CAA

Salaries and Per Diem

Regional Supervisors	Salary	450/m	4	21,600
Senior Supervisors	Per diem	20/d	2/140	5,600
	Per diem	15/d	6/230	20,700
Technicians	Salary	285/m	4	13,680
Drivers	Salary	182/m	3	6,552
Assistant Observers	Salary	100/m	20	24,000
Observers	Part-time		80	30,000
Drivers	Per diem	30%	8	9,360
Sub-Total				<u>\$131,492</u>

Personnel Services

Training 12,000

Non-Personnel Services

Office Maintenance				50,000
Equipment Maintenance				125,000
Equipment				
Vehicles	20,000/ea		3	60,000
Met. Instruments*				140,000
SSB Transceivers	10,000/ea		15	150,000
Support for Schools Undertaking				
Meteorological Activities				<u>53,500</u>
				578,500
Miscellaneous				<u>25,000</u>
Sub-Total				<u>\$746,992</u>

- * Class I Stations 5
- Class II Stations 20
- Class III Stations 30
- Class IV Stations 50

ETHIOPIA

GRAIN STORAGE AND MARKETING PROJECT*

CROP FORECASTING

Background

1. Crop forecasting, an essential prerequisite for the success of any proposed Government market intervention, has been attempted in the past by a number of different agencies - often resulting in considerable duplication of effort. The results frequently have been of doubtful validity, because of the underlying difficulties facing crop forecasting in Ethiopia, which include:

- (a) The paucity of reliable basic data as to population, land holdings, cropping components, production, etc.;
- (b) The fact that production has been largely in the hands of a very large number of small subsistence-type farmers;
- (c) The weakness of the administrative machine, particularly at field level; and
- (d) The existence of numerous microclimatic zones, so that areas of localized crop failure can occur when production elsewhere is normal, as happened during the recent (1971-72) famine in Wollo and Tigre provinces.

2. Under Ethiopian conditions, the objectives of any crop forecasting system should be:

- (a) To provide reliable information on which Government can plan its marketing policy before and during a crop season, e.g., to arrange for imports if a crop deficit is forecast or to make plans for buffer stocking in the case of a bumper crop; and
- (b) To act as an "early warning system" of localized crop failures, permitting relief measures to be planned and implemented in time.

* Annex II - IBRD, Grain Storage and Marketing.

The Present Position

3. Since 1971/72, the Agricultural Statistics Division of the Planning and Programming Department of the Ministry of Agriculture has attempted to build up a crop reporting system based on the appointment of members of the local administration staff as Woreda (i.e., sub-district) reporting officers. With supervision from Addis Ababa, the survey covered about one third (131 out of total of 431) of all woredas but these included the more important producing areas. Reports took the form of subjective judgements of total crop production expressed in such terms as "above average", "average", "below average" and "substantially below average", where "average" remained unquantified.

4. In 1971/72 (E.C. 1964), reports were based on one preharvest visit by mobile teams sent from Addis Ababa. In 1972/73, reports were prepared at three stages, corresponding to the germination, maturity and harvest periods. Rudimentary as this system was, it did identify critical areas in Tigre and Wollo provinces, and in view of this, a special assessment of the 1973 "belg" or small rains crop was made, in which particular attention was paid to rainfall data as an indicator of crop performance, and this confirmed the emergence of famine conditions.

5. The following conclusion was reached in the report on "a policy and action plan for strengthening national food security in Ethiopia."^{1/} "It appears from the above information that although the embryo crop reporting system was quite capable of providing timely warning of serious crop failures, it had not been built into any officially recognized system for regularly assessing the country's state of food and agriculture. Action was not taken on the early warning provided by the crop report of adverse weather conditions and indeed was delayed until the seriousness of the situation became apparent by the appearance of starving people and dead animals.

6. Within the Relief and Rehabilitation Commission (RRC), a center has been set up for the collection and analysis of field reports from all other sources, together with available meteorological data. Whenever this examination suggests that crop failure conditions are appearing, special reconnaissance teams are to be sent to investigate the situation in the area(s) concerned.

7. As part of the internal evaluation of the programs of the Extension and Project Implementation Department (EPID) of the Ministry of Agriculture, crop sampling surveys have been instituted in Minimum Package Program areas. In 1973/74, samples were collected from 26 of

^{1/} FAO Report ES C/FSP/ETH, November 1974.

these areas and 14 Demonstration Areas (i.e., virtually all of EPID field areas in 1973), by EPID marketing assistants, under a scheme prepared and supervised by EPID Headquarters. Improvements in the methodology used in these crop sampling surveys and in the interpretation of their results are currently under examination at EPID Headquarters for incorporation in future surveys. Although primarily designed to show the effects of the use of fertilizer, the results of these surveys provide some useful data on average yields by crop and district which over time would allow more precise forecasts of production. With some training the survey staff could be utilized (see para. 11C) to provide crop forecasts for the areas concerned, without prejudice to their primary duties.

8. Rural Sample Surveys conducted by the Central Statistical Office since 1963, have produced estimates of the areas under various crops, primarily in the small scale farming sector, in the provinces surveyed. Coupled with yield estimates suggested by the Institute of Agricultural Research, these results have been used to supply the production figures used in the national accounts.

Future Needs

9. A technical working group, on which were represented the Civil Aviation Administration (Meteorological Service), the Ministry of Agriculture (Extension and Project Implementation (EPID) and Planning and Programming (PPD) Departments), the Livestock and Meat Board, the Central Statistical Office and Ministry of Education, prepared a report, dated June 2, 1975, on "Data Collection related to factors affecting food production and human nutrition in Ethiopia". The report proposes the establishment of a regular reporting system of major parameters affecting food production with a view to predicting areas of food deficit and surplus. As part of this "Consolidated Food and Nutrition Information System (CFNIS)", the Ministry of Agriculture would extend the coverage of its present crop reporting service but, as of July, 1975, no additional budgetary resources had been allocated to implement this proposal.

10. Although the emphasis in these proposals is on information on which relief operations can be based, there is an equally urgent need to improve and strengthen the crop reporting system, thereby permitting the Government to make soundly based decisions on marketing policy (Annex 4) and assisting the Agricultural Marketing Corporation (AMC) in executing that policy. The project proposals outlined below have been framed with both objectives in view.

Project Proposals

11. The project proposals may be summarized as follows:
 - (a) The existing unit within the Agricultural Statistics Division of the Ministry of Agriculture which is at present responsible for crop reporting should be put on a permanent basis under the title of "Crop Information Unit".
 - (b) This Crop Information Unit should cease to rely on mobile reporting teams and instead operate through trained local reporters as indicated in (c) and (d) below.
 - (c) In EPID areas, staff responsible for crop sampling should, with additional training, be made responsible for making regular crop reports which would be fed back to the Crop Information Unit.
 - (d) Outside EPID areas, reporters would be selected and trained to make crop reports at specified intervals. These reports would be summarized and transmitted as quickly as possible to the Crop Information Unit at Addis Ababa by MOA provincial offices.
 - (e) Crop reports from both EPID and non-EPID areas should be on a uniform basis and should be made at specified intervals, less than three times corresponding to sowing, germination and maturing periods of the crops concerned.
 - (f) In addition to these crop reports, the Crop Information Unit would collect relevant data (e.g., meteorological information) from other sources.

12. The main responsibilities of the Crop Information Unit will be:
 - (a) To collate these crop reports;
 - (b) To produce interim summaries as soon as possible and to pass them to:
 - (i) The new Market Intelligence Department of EGB (Annex 10) so that they can be included in the reviews on which Government will make decisions on marketing policy;

(ii) AMC to assist it in planning its operations to implement Government's marketing policy; and

(iii) The Relief and Rehabilitation Commission to enable it to investigate further any indications of incipient crop failure in particular areas.

(c) To publish eventually a series of crop reports.

13. To carry out these tasks the Crop Information Unit would need to be strengthened by the provision of:

(a) An internationally recognized expert to act as head of the Crop Information Unit for three years. During this period he would be required to:

(i) Design and institute improved crop reporting procedures;

(ii) Devise training schemes for crop reporters in both EPID and non-EPID areas and assist in their implementation;

(iii) Establish appropriate transmission channels;

(iv) Prepare and install proper collating and publication procedures at Crop Information Unit Headquarters; and

(v) Train his Ethiopian deputy who could take over from him at the end of his assignment;

(b) Vehicles to supervise the data collection;

(c) Additional office equipment and Headquarters for the summarizing and analysis of field reports;

(d) Training facilities for all crop reporting field staff; and

(e) Funds to employ local reporters in non-EPID areas.

14. The project would also fund a study to explore the possibilities of using remote sensing techniques utilizing earth satellite images for crop forecasting in Ethiopia. Ten areas with varying agro-ecological conditions and with information about yields and area cultivated would be selected. Satellite images for two different years (preharvest season) would be analyzed for each area in order to determine the possibilities of distinguishing changes in area devoted to grain cultivation, changes in area of specific grain crops and changes in yields due to weather fluctuation and/or improved cultivation practices.

15. The costs for the Crop Information Unit are itemized in Table 1.

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GRAIN STORAGE AND MARKETING PROJECT

Crop Information Unit

Table 1

	Grade	Unit Cost	1976/77	1977/78	1978/79	1979/80	Total	For. Exch. %	For. Exch. Total
A. Capital Costs									
4 wheel drive vehicles		19,000	(2) 38,000	-	-	-	38,000	75	28,500
Calculators		1,750	(3) 5,250	-	-	-	5,250	80	4,200
Typewriter (English)		3,000	3,000	-	-	-	3,000	80	4,200
Typewriter (Amharic)		3,000	(2) 6,000	-	-	-	6,000	80	4,800
Office furniture		2,800	2,800	-	-	-	2,800	40	1,120
Total			<u>55,050</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>55,050</u>	<u>75</u>	<u>41,020</u>
B. Operating Costs									
(a) Salaries & Wages									
Chief of Unit	Expatriate	78,000	78,000	78,000	78,000	-	234,000	75	175,500
Local Counterpart	PS3		9,480	9,480	10,020	10,020	39,000	-	-
Typist	CF9		(2) 9,480	9,480	10,080	10,080	39,120	-	-
Sub-Total (a)			96,960	96,960	98,100	20,100	312,120	56	175,500

ETHIOPIA

GRAIN STORAGE AND MARKETING PROJECT

Crop Information Unit

	Grade	Unit Cost	1976/77	1977/78	1978/79	1979/80	Total	For. Exch. %	For. Exch. Total
(b) Miscellaneous									
Training costs incl. transport									
(i) EPID Staff									
		\$30(3 days @10.-)	(350)10,500	-	(350)10,500	-	21,000	-	-
(ii) Non-EPID Staff									
		\$30(3 days @10.-)	(500)15,000	-	(500)15,000	-	30,000	-	-
Vehicle Operating Costs									
25,000 km @Eth.\$0.40									
			(2)20,000	(2)20,000	(2)20,000	(2)20,000	80,000	75	60,000
Subsistence									
			2,430	2,430	2,490	1,140	8,490	-	-
Office Supplies									
			3,600	3,600	3,600	3,600	14,400	40	5,760
Part time payment to crop reporters in non-EPID areas									
	240		(500) 120,000	(500) 120,000	(500) 120,000	(500) 120,000	480,000	-	-
Utilities, rent, telephone 1/									
			-	-	-	-	-	-	-
Sub-Total (b)									
			171,530	146,030	171,590	144,740	633,890	10	65,760
Total (a + b)									
			268,490	242,990	269,690	164,840	946,010	25	241,260
Total (A + B)									
			323,540	242,990	269,690	164,840	1,001,060	28	282,280

1/ Not provided since unit will be located in MOA.

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GRAIN STORAGE AND MARKETING PROJECT

Crop Information Unit

Table 1, Page 3

	Grade	Unit Cost	1976/77	1977/78	1978/79	1979/80	Total	For. Exch. %	For. Exch. Total
C. Remote Sensing Experiment			30,000	30,000	40,000	50,000	150,000	75	112,500
D. Physical contingencies (5%)			16,178	12,150	13,485	8,242	50,055	48.5	24,270
Price contingencies <u>2/</u>			24,299	35,209	60,680	51,100	171,288	48.5	83,070
GRAND TOTAL			394,017	320,349	383,855	274,182	1,372,403	36	502,130

2/ Capital costs 10%; operating costs 7% annually; remote sensing: No contingencies.

December 17, 1975.

Personnel Services

Internal Travel	200/m	3	<u>7,200</u>
			7,200

Non-Personnel Services

Office Maintenance	500/m		6,000
Computer Supplies			
96 Col Cards	15/ea	100 bx	1,500
Printout Paper	45/ea	12 bx	540
Computer Component Rental			
Software	90/m		840
Core Storage (32 K)	3,500/m		42,000
Graph Plotter	250/m		3,000
Punch - Verifiers (rental)	420/m		<u>25,200</u>
			79,080
Miscellaneous			<u>10,000</u>
Sub-Total			<u><u>\$210,800</u></u>

D. CROP ASSESSMENT

Salaries & Per Diem

Reporting Agents	Salary	275/m	80	264,000
	Hardship Allowance	30%		66,000
Drivers	Salary	225/m	6	16,200
	Hardship Allowance	30%		<u>4,050</u>
				350,250

Personnel Services

Internal Travel (Field Reporters)				<u>78,620</u>
				78,620

Non-Personnel Services

Office Rental	50/m	60	36,000
Office Maintenance	50/m	80	48,000
Vehicles' Fuel & Maintenance			<u>36,000</u>
			120,000
Miscellaneous			<u>10,000</u>
Sub-Total			<u><u>\$558,870</u></u>

E. LIVESTOCK MARKET AND PASTORAL ASSESSMENT* LMB

Salaries & Per Diem

Coordinator	Salary	900/m	1	10,800
	Per diem	18/d	100d	1,800
Regional Supervisors	Salary	450/m	4	21,600
	Hardship Allowance	50%		6,480
Reporting Agents	Salary	275/m	15	49,500
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Market Reporters Assistants	Part-time	60/m	150	108,000
	Casual	12/m	300	43,200
				<u>256,230</u>

Personnel Services

Internal Travel				
Training	200/m		1	2,400
				<u>10,000</u>
				12,400

Non-Personnel Services

Field Office Rental	80/m		20	19,200
Field Office Maintenance (includes postage, stationary, etc.)	80/m		20	19,200
Local Transport	30/m		15	5,400
Fuel & Maintenance (vehicles)				30,000
Equipment				
Office Furniture	150/ea		20	3,000
Scales Tapes, Pasture Assessment etc.	350/ea		150	50,000
Camping Equipment				20,000
Fencing Materials				6,500
Motor Cycles	3,500/ea		4	12,000
				<u>165,300</u>
Miscellaneous				<u>20,000</u>
Sub-Total				<u>453,930</u>

* To be coordinated with other programs: ILCA/LMB
IBRD/LMB etc. See Annex XVII, IBRD Crop Storage and
Marketing.

F. NUTRITION ASSESSMENT - ENI

Salaries and Per Diem

Coordinator	Per diem	20/d	120d	2,400
Senior Supervisors	Per diem	20/d	2/120d	4,800
Regional Supervisors	Salary	450/m	5	27,000
	Hardship Allowance	30%		9,000
Reporting Agents	Salary	275/m	20	66,000
	Hardship Allowance	30%		22,000
Drivers (field)	Salary	225/m	5	13,500
	Hardship Allowance	30%		4,050
Drivers	Per diem	15/d	2/120	3,600
				<u>152,350</u>

Personnel Services

Internal Travel		30/m	30	10,800
Clothing Allowance				2,100
Insurance				<u>3,000</u>
				15,900

Non-Personnel Services

Field Office Rental		60/m	25	1,500
Office Maintenance		100/m	25	30,000
Fuel and Maintenance		700/m	7	58,800
Equipment				
Vehicles		30,000/ea	2	<u>60,000</u>
				150,300
Miscellaneous				<u>10,000</u>
Sub-Total				<u><u>\$328,550</u></u>

G. CLIMATE ASSESSMENT - CAA

Salaries and Per Diem

Regional Supervisors	Salary	450/m	4	21,800
Senior Supervisors	Per diem	20/d	2/140	5,600
	Per diem	15/d	6/230	20,700
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Observers	Part-time		80	30,000
Drivers	Per diem	30%	8	9,360
Sub-Total				<u>\$131,492</u>

Personnel Services

Training 12,000

Non-Personnel Services

Office Maintenance				50,000
Equipment Maintenance				125,000
Equipment				
Vehicles	20,000/ea		3	60,000
Met. Instruments*				140,000
SSB Transceivers	10,000/ea		15	150,000
Support for Schools Undertaking				
Meteorological Activities				53,500
				578,500
Miscellaneous				25,000
Sub-Total				<u>\$746,992</u>

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ETHIOPIA

GRAIN STORAGE AND MARKETING PROJECT*

CROP FORECASTING

Background

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- (d) The existence of numerous microclimatic zones, so that areas of localized crop failure can occur when production elsewhere is normal, as happened during the recent (1971-72) famine in Wollo and Tigre provinces.

2. Under Ethiopian conditions, the objectives of any crop forecasting system should be:

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- (b) To act as an "early warning system" of localized crop failures, permitting relief measures to be planned and implemented in time.

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The Present Position

3. Since 1971/72, the Agricultural Statistics Division of the Planning and Programming Department of the Ministry of Agriculture has attempted to build up a crop reporting system based on the appointment of members of the local administration staff as Woreda (i.e., sub-district) reporting officers. With supervision from Addis Ababa, the survey covered about one third (131 out of total of 431) of all woredas but these included the more important producing areas. Reports took the form of subjective judgements of total crop production expressed in such terms as "above average", "average", "below average" and "substantially below average", where "average" remained unquantified.

4. In 1971/72 (E.C. 1964), reports were based on one preharvest visit by mobile teams sent from Addis Ababa. In 1972/73, reports were prepared at three stages, corresponding to the germination, maturity and harvest periods. Rudimentary as this system was, it did identify critical areas in Tigre and Wollo provinces, and in view of this, a special assessment of the 1973 "belg" or small rains crop was made, in which particular attention was paid to rainfall data as an indicator of crop performance, and this confirmed the emergence of famine conditions.

5. The following conclusion was reached in the report on "a policy and action plan for strengthening national food security in Ethiopia."^{1/} "It appears from the above information that although the embryo crop reporting system was quite capable of providing timely warning of serious crop failures, it had not been built into any officially recognized system for regularly assessing the country's state of food and agriculture. Action was not taken on the early warning provided by the crop report of adverse weather conditions and indeed was delayed until the seriousness of the situation became apparent by the appearance of starving people and dead animals.

6. Within the Relief and Rehabilitation Commission (RRC), a center has been set up for the collection and analysis of field reports from all other sources, together with available meteorological data. Whenever this examination suggests that crop failure conditions are appearing, special reconnaissance teams are to be sent to investigate the situation in the area(s) concerned.

7. As part of the internal evaluation of the programs of the Extension and Project Implementation Department (EPID) of the Ministry of Agriculture, crop sampling surveys have been instituted in Minimum Package Program areas. In 1973/74, samples were collected from 26 of

^{1/} FAO Report ES C/FSP/ETH, November 1974.

these areas and 14 Demonstration Areas (i.e., virtually all of EPID field areas in 1973), by EPID marketing assistants, under a scheme prepared and supervised by EPID Headquarters. Improvements in the methodology used in these crop sampling surveys and in the interpretation of their results are currently under examination at EPID Headquarters for incorporation in future surveys. Although primarily designed to show the effects of the use of fertilizer, the results of these surveys provide some useful data on average yields by crop and district which over time would allow more precise forecasts of production. With some training the survey staff could be utilized (see para. 11C) to provide crop forecasts for the areas concerned, without prejudice to their primary duties.

8. Rural Sample Surveys conducted by the Central Statistical Office since 1963, have produced estimates of the areas under various crops, primarily in the small scale farming sector, in the provinces surveyed. Coupled with yield estimates suggested by the Institute of Agricultural Research, these results have been used to supply the production figures used in the national accounts.

Future Needs

9. A technical working group, on which were represented the Civil Aviation Administration (Meteorological Service), the Ministry of Agriculture (Extension and Project Implementation (EPID) and Planning and Programming (PPD) Departments), the Livestock and Meat Board, the Central Statistical Office and Ministry of Education, prepared a report, dated June 2, 1975, on "Data Collection related to factors affecting food production and human nutrition in Ethiopia". The report proposes the establishment of a regular reporting system of major parameters affecting food production with a view to predicting areas of food deficit and surplus. As part of this "Consolidated Food and Nutrition Information System (CFNIS)", the Ministry of Agriculture would extend the coverage of its present crop reporting service but, as of July, 1975, no additional budgetary resources had been allocated to implement this proposal.

10. Although the emphasis in these proposals is on information on which relief operations can be based, there is an equally urgent need to improve and strengthen the crop reporting system, thereby permitting the Government to make soundly based decisions on marketing policy (Annex 4) and assisting the Agricultural Marketing Corporation (AMC) in executing that policy. The project proposals outlined below have been framed with both objectives in view.

Project Proposals

11. The project proposals may be summarized as follows:

- (a) The existing unit within the Agricultural Statistics Division of the Ministry of Agriculture which is at present responsible for crop reporting should be put on a permanent basis under the title of "Crop Information Unit".
- (b) This Crop Information Unit should cease to rely on mobile reporting teams and instead operate through trained local reporters as indicated in (c) and (d) below.
- (c) In EPID areas, staff responsible for crop sampling should, with additional training, be made responsible for making regular crop reports which would be fed back to the Crop Information Unit.
- (d) Outside EPID areas, reporters would be selected and trained to make crop reports at specified intervals. These reports would be summarized and transmitted as quickly as possible to the Crop Information Unit at Addis Ababa by MOA provincial offices.
- (e) Crop reports from both EPID and non-EPID areas should be on a uniform basis and should be made at specified intervals, less than three times corresponding to sowing, germination and maturing periods of the crops concerned.
- (f) In addition to these crop reports, the Crop Information Unit would collect relevant data (e.g., meteorological information) from other sources.

12. The main responsibilities of the Crop Information Unit will be:

- (a) To collate these crop reports;
- (b) To produce interim summaries as soon as possible and to pass them to:
 - (i) The new Market Intelligence Department of EGB (Annex 10) so that they can be included in the reviews on which Government will make decisions on marketing policy;

- (ii) AMC to assist it in planning its operations to implement Government's marketing policy; and
- (iii) The Relief and Rehabilitation Commission to enable it to investigate further any indications of incipient crop failure in particular areas.

(c) To publish eventually a series of crop reports.

13. To carry out these tasks the Crop Information Unit would need to be strengthened by the provision of:

- (a) An internationally recognized expert to act as head of the Crop Information Unit for three years. During this period he would be required to:
 - (i) Design and institute improved crop reporting procedures;
 - (ii) Devise training schemes for crop reporters in both EPID and non-EPID areas and assist in their implementation;
 - (iii) Establish appropriate transmission channels;
 - (iv) Prepare and install proper collating and publication procedures at Crop Information Unit Headquarters; and
 - (v) Train his Ethiopian deputy who could take over from him at the end of his assignment;
- (b) Vehicles to supervise the data collection;
- (c) Additional office equipment and Headquarters for the summarizing and analysis of field reports;
- (d) Training facilities for all crop reporting field staff; and
- (e) Funds to employ local reporters in non-EPID areas.

14. The project would also fund a study to explore the possibilities of using remote sensing techniques utilizing earth satellite images for crop forecasting in Ethiopia. Ten areas with varying agro-ecological conditions and with information about yields and area cultivated would be selected. Satellite images for two different years (preharvest season) would be analyzed for each area in order to determine the possibilities of distinguishing changes in area devoted to grain cultivation, changes in area of specific grain crops and changes in yields due to weather fluctuation and/or improved cultivation practices.

15. The costs for the Crop Information Unit are itemized in Table 1.

ETHIOPIA

GRAIN STORAGE AND MARKETING PROJECT

Crop Information Unit

Table 1

	Grade	Unit Cost	1976/77	1977/78	1978/79	1979/80	Total	For. Exch. %	For. Exch. Total
A. Capital Costs									
4 wheel drive vehicles		19,000	(2) 38,000	-	-	-	38,000	75	28,500
Calculators		1,750	(3) 5,250	-	-	-	5,250	80	4,200
Typewriter (English)		3,000	3,000	-	-	-	3,000	80	4,200
Typewriter (Amharic)		3,000	(2) 6,000	-	-	-	6,000	80	4,800
Office furniture		2,800	2,800	-	-	-	2,800	40	1,120
Total			<u>55,050</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>55,050</u>	<u>75</u>	<u>41,020</u>
B. Operating Costs									
(a) Salaries & Wages									
Chief of Unit	Expatriate	78,000	78,000	78,000	78,000	-	234,000	75	175,500
Local Counterpart	PS3		9,480	9,480	10,020	10,020	39,000	-	-
Typist	CF9		(2) 9,480	9,480	10,080	10,080	39,120	-	-
Sub-Total (a)			96,960	96,960	98,100	20,100	312,120	56	175,500

ETHIOPIA

GRAIN STORAGE AND MARKETING PROJECT

Crop Information Unit

	Grade	Unit Cost	1976/77	1977/78	1978/79	1979/80	Total	For. Exch. %	For. Exch. Total
(b) Miscellaneous									
Training costs incl. transport									
(i) EPID Staff									
		\$30(3 days @10,-)	(350)10,500	-	(350)10,500	-	21,000	-	-
(ii) Non-EPID Staff									
		\$30(3 days @10,-)	(500)15,000	-	(500)15,000	-	30,000	-	-
Vehicle Operating Costs									
25,000 km @Eth.\$0.40									
			(2)20,000	(2)20,000	(2)20,000	(2)20,000	80,000	75	60,000
Subsistence									
			2,430	2,430	2,490	1,140	8,490	-	-
Office Supplies									
			3,600	3,600	3,600	3,600	14,400	40	5,760
Part time payment to crop reporters in non-EPID areas									
	240		(500) 120,000	(500) 120,000	(500) 120,000	(500) 120,000	480,000	-	-
Utilities, rent, telephone 1/									
			-	-	-	-	-	-	-
Sub-Total (b)									
			171,530	146,030	171,590	144,740	633,890	10	65,760
Total (a + b)									
			268,490	242,990	269,690	164,840	946,010	25	241,260
Total (A + B)									
			323,540	242,990	269,690	164,840	1,001,060	28	282,280

1/ Not provided since unit will be located in MOA.

ETHIOPIA

GRAIN STORAGE AND MARKETING PROJECT

Crop Information Unit

Table 1, Page 3

	Grade	Unit Cost	1976/77	1977/78	1978/79	1979/80	Total	For. Exch. %	For. Exch. Total
C. Remote Sensing Experiment			30,000	30,000	40,000	50,000	150,000	75	112,500
D. Physical contingencies (5%)			16,178	12,150	13,485	8,242	50,055	48.5	24,277
Price contingencies <u>2/</u>			24,299	35,209	60,680	51,100	171,288	48.5	83,075
GRAND TOTAL			394,017	320,349	383,855	274,182	1,372,403	36	502,132

2/ Capital costs 10%; operating costs 7% annually; remote sensing: No contingencies.

December 17, 1975.

SUB-PROJECT IMPLEMENTATION AGREEMENT

(SUB-PROJECT SECTION B)

ETHIOPIAN RECOVERY AND REHABILITATION PROJECT

Grant: 663-

Sub-Project: Southern Gemu Gofa
Drought Area Roads

Number: E-8

1. Description of the Activity

Sub-Project Section B will consist of the construction of approximately 230 kilometers of all-weather, modified "class B" standard road from the Waito river crossing to Arbore, Turmi and terminating at the Omo river at Omo Raate (see map, Annex XXIII).

Selection of this road was based upon identification by the Relief and Rehabilitation Commission and provincial administration of the most critically drought affected areas in Gemu Gofa Province; and following field observation by ERA and USAID and final approval by ERA, RRC.

The total cost of this activity is estimated at US\$6,422,000 of which US\$4,000,000 represents the total US contribution and US\$2,422,000 the contribution of the Government of Ethiopia (GOE) through the Relief and Rehabilitation Commission (RRC).

2. Implementing Agency

a. ERA/RRD

Performance of Sub-Project, Section B will be the obligation of and will be implemented by the Government of Ethiopia acting through the Ethiopian Roads Authority (ERA) under the overall coordination of the RRC over a period of 60 months following authorization of US funds and signing of the Activity Implementation Letter. The Rural Roads Division (RRD) of the ERA will have the primary responsibility for the construction of the

drought roads described in this activity. RRD will call upon other divisions of ERA for assistance in the provision of skilled manpower, planning and programming, fiscal management, technical assistance, and equipment support. Overall administration of the activity is the responsibility of the Rural Roads Coordinator under the guidance of the General Manager of ERA.

b. RRC

The RRC is responsible for the planning and implementation of drought relief and recovery operations in Ethiopia and the securing and coordination of donor assistance in support of drought programs. As such, the RRC's role in this activity is one of coordination between the donor, USAID, and the ERA. This will be accomplished following much the same procedure as is already established in the execution of USAID funded Activity E-2, Rural Roads Construction, with certain modifications described as follows. Firstly, activity funding from USAID to the GOE - reimbursements - will flow directly from USAID to ERA with concurrence from the RRC; secondly, reports - financial, progress, evaluations, and others as required - will pass directly from ERA to USAID with copies to the RRC. Changes in the implementation plan of this activity will be dealt with jointly by the RRC, ERA and USAID through formal procedures.

c. Definition of Responsibilities

ERA/RRD specifically will be responsible for:

1. Planning and coordination.
2. Procurement of equipment.
3. Equipment repair.
4. Operations and implementation.
5. Records and accounts at the working level.
6. Personnel management.

3. Implementation Schedule

The obligations of the Government of Ethiopia in regard to the construction of the road are divided into four phases spread out over a 60-month period as follows:

Phase I (9 mos.): During this period of time the following tasks will be completed by ERA/RRD.

- Survey of 60 kms of road from the Waito river to Arbore.
- Initiation of soils testing and location of surfacing materials.
- Preparation of specifications and contract documents for procurement of equipment and spare parts.
- Local procurement of construction equipment and materials.
- Construction of road/maintenance camp at Waito river.
- Commence construction of Waito river Arbore road section (labor intensive).
- Assign spare parts expeditor/mechanic.
- Augment on-going construction of the Arba Minch-Waito river access road.

Phase II (12 mos.): This phase starts following the award by GOE of a contract or contracts to suppliers of U.S. source and origin equipment. This phase of construction includes a period of rainy season of approximately five months. The following tasks will be completed:

- The labor intensive construction of the road from the Waito river to Arbore will be continued.
- Equipment and spare parts will be cleared through the Ethiopian port.
- The completion of road survey and the soils investigation for surfacing materials.
- The start of construction of the Section Camp #2 at Dimeka.
- The construction of a Bailey Bridge at the Waito river crossing.

Phase III (24 mos.): During this period two construction units will be functioning simultaneously, at the Waito river towards Arbore, and at Turmi working easterly toward Arbore. The following tasks will be completed:

- The construction of the Waito river - Arbore road section continues.
- The construction (equipment/labor) of part of the road section from Turmi to Arbore.
- The construction of the Section Camp at Dimeka will be completed.
- Continuation of the equipment and spare parts placement.
- Preparation for 10 ton ferry crossing at the Omo river.
- Start maintenance of road section started in Phase I.
- Completion of approximately 65-70% road from Waito river to Turmi.

Phase IV (15 mos.): This phase commences at Turmi with all possible equipment support and ends at the Omo river crossing. This phase includes two rainy seasons totaling approximately ten months.

The following tasks will be accomplished:

- Placement of a ten-ton ferry at the Omo river crossing will be completed.
- Completion of second maintenance camp in the vicinity of the Omo river crossing will be completed.
- Construction of the Turmi-Omo river crossing section.
- Completion of all sections of roads construction.

4. Objectives and Targets

- a. This activity is designed to prevent recurrence of further famine in Southern Gemu Gofa Province as a result of drought and other natural causes by providing all-weather road access and improved government services to the drought prone area. This will increase the flow of heavy trucks and other vehicles carrying goods and services into the area and allow drought recovery and rehabilitation programs to proceed, and allow for faster more effective early detection of drought, famine and other disaster conditions.
- b. Monitoring will commence following the signing of the Activity Implementation Letter and continue through the life of the activity to assure that the construction of roads is carried out in accordance with the implementation plan and according to standards established therein. Activity evaluation will proceed in accordance with the Evaluation Plan appearing in another section of this project paper.

<u>5. Budget Summary</u>	<u>U.S.\$</u>
a. Cost of equipment including 5% for spare parts, contingency and escalation	2,100,000
b. Section camp cost including contingency	112,000*
c. Maintenance camp cost including contingency 67,000 x 2 camps	134,000*
d. Cost of labor hand tools including contingency	40,000*
e. Spare parts expeditor/mechanic	35,000
f. Recurrent labor costs for 5 years including 30% increase in wages	900,000+
g. GOE/ERA staff salaries for 5 years including 30% increase in wages	1,248,000*+
h. Recurrent operation costs POL and materials x 5 years including 50% escalation for POL	1,475,000+
i. ERA headquarters support x 5 years	75,000+
j. Inland transportation costs	50,000*
k. GOE off-shelf equipment	153,000*
l. Omo river ferry	<u>100,000*</u>
Grand-Total	<u>\$6,422,000</u>

* GOE contribution.

+ Shared costs: GOE - 49%, USAID - 51%.

SOUTHERN GEMU GOFA DROUGHT AREA ACCESS ROADSIMPLEMENTATION SCHEDULE

<u>No.</u>	<u>Description of Activities</u>	<u>Responsible Agent(s)</u>	<u>Time (Month)</u>
Phase I (9 mos.)	1. Sign Agreement	USAID/COE	1
	2. Spare parts expeditor/mechanic hired	ERA	1
	3. Off-shelf equipment procured	ERA	2
	4. Start work Waito-Arbore section	ERA	4
	5. Additional construction equipment for Arba Minch-Konso-Djinka road	ERA	5
	6. Waito Section/maintenance camp construction	ERA	9
	7. Survey/soils test Waito-Arbore section completed	ERA	9
	8. Evaluation-Project Appraisal report	USAID	9
Phase II (12 mos.)	9. Equipment/spare parts specs., complete, contract let	ERA	11
	10. Clearing-grubbing complete - Waito-Arbore Section	ERA	17
	11. Bailey bridge constructed at Waito river	ERA	18
	12. Turmi-Hamer mt. section work starts	ERA	18
	13. Arbore-Hamer mt. section work starts	ERA	18
	14. Off-shore equipment on the job	ERA	21
	15. Survey/soil test completed-Turmi-Hamer mt. sec.	ERA	21
	16. Survey/soils test completed-Arbore-Hamer mt.sec.	ERA	21
	17. Special evaluation	USAID	21

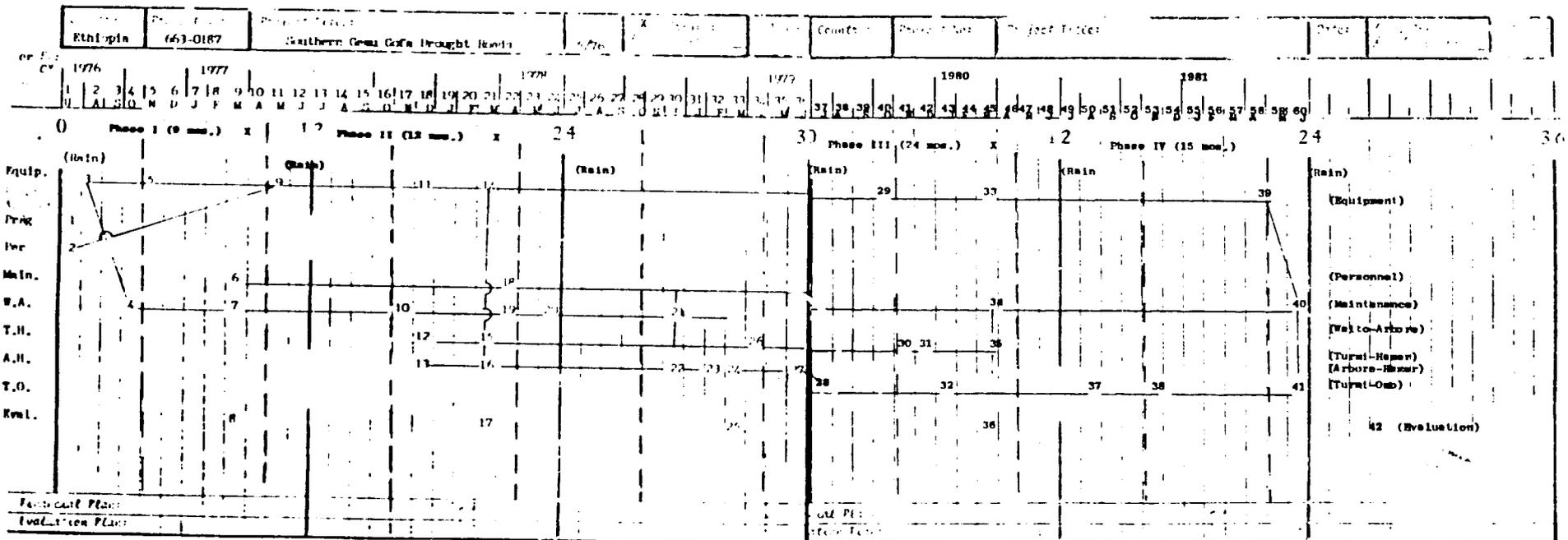
No.	Description of Activities	Responsible Agent(s)	Time (Month)
18.	Maintenance of completed road sections	ERA	22
19.	Earth work completed-Waito-Arbore	ERA	22
20.	Drainage completed-Waito-Arbore	ERA	24
21.	Surfacing completed-Waito-Arbore	ERA	30
22.	Clearing/grubbing completed-Arbore-Hamer	ERA	30
23.	Earth work completed-Arbore-Hamer	ERA	32
24.	Drainage completed-Arbore-Hamer	ERA	33
25.	Evaluation (PAR)	USAID	33
26.	Clearing/grubbing completed-Turmi-Hamer	ERA	34
27.	Surfacing completed-Arbore-Hamer	ERA	36
28.	Turmi-Omo section work starts	ERA	37
29.	GOE starts plans for Omo ferry crossing	RRC/ERA	40
30.	Earth work completed-Turmi-Hamer	ERA	41
31.	Drainage completed-Turmi-Hamer	ERA	42
32.	Clearing-grubbing completed-Turmi-Omo sec.	ERA	43
33.	70% equipment in operation - all sections	ERA	45
34.	Section camp Dimeka completed	ERA	45
35.	Surfacing completed-Turmi-Hamer section	ERA	45
36.	Evaluation (PAR)	USAID	45
37.	Earth work completed-Turmi-Omo	ERA	50
38.	Drainage completed-Turmi-Omo	ERA	53
39.	Complete construction Omo ferry	RRC/ERA	58
40.	Omo maintenance camp constructed	ERA	60
41.	Surfacing completed-Turmi-Omo	ERA	60

Phase III (24 mos.)

Phase IV (15 mos.)

<u>No.</u>	<u>Description of Activities</u>	<u>Responsible Agent(s)</u>	<u>Time (Month)</u>
	<u>Post Actions</u>		
42.	Close out evaluation	USAID	64

PROJECT PERFORMANCE TRACKING (PPT) SYSTEM (IMPLEMENTATION SCHEDULE)



BEST AVAILABLE COPY

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

ANNEX AA
from FY 1981 to FY 80
Total U.S. Funding: \$4,000,000
Date Prepared: 4/76

Project Title & Number: UNEP/FAO Joint Drought Area Access Roads

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Program or Sector Goal: The broader objective to which this project contributes:</p> <p>To prevent the recurrence of future famine and suffering in Southern Gemu Gofa as a result of drought and other natural causes.</p>	<p>Measures of Goal Achievement:</p> <p>Decrease in loss of life as a result of famine or other disasters.</p>	<p>1. GOE agency reports 2. Field observations.</p>	<p>Assumptions for achieving goal targets:</p> <p>1. Drought is the major cause of famine in the area. 2. Preventing recurrence of future famine remains a high GOE priority.</p>
<p>Project Purpose:</p> <p>To improve communications and government services for the inhabitants of the drought prone areas of Southern Gemu Gofa province through the construction of 230 kms. of all-weather access roads by 1981.</p>	<p>Conditions that will indicate purpose has been achieved: End of project status.</p> <p>1. Increased inflow of heavy trucks and other vehicles carrying goods and services into the area. 2. Increased govt and commercial services in the area. 3. Quicker access into the area. 4. Dev. of drought rehab. projects along Gato, Waito, Omo rivers. 5. Early detection of drought, famine and other disaster emergencies in the area.</p>	<p>1. Vehicle count reports (ERA). 2. Field observations. 3. Reports. 4. Review of GOE drought rehabilitation proposal in the area. 5. RHC reports.</p>	<p>Assumptions for achieving purpose:</p> <p>1. Road construction will allow increased traffic flow into the area. 2. Road construction in the area will continue as a GOE priority.</p>
<p>Outputs:</p> <p>1. Construction of all-weather roads. 2. Section/maintenance camp built (Waito) 3. Section camp built (Dimeka). 4. Bailey bridge built (Waito). 5. Ferry crossing (Omo). 6. Maintenance camp (Kelem).</p>	<p>Magnitude of Outputs:</p> <p>1. 21 m.m. 45 m.m. 60 m.m. 40 kms. 150 kms. 230 kms. Total 230 kms.</p> <p>2. Waito maint. camp complete, operational no. 9. 3. Waito bailey bridge construction no. 21. 4. Dimeka section camp complete, operational no. 45. 5. Kelem maintenance camp complete, operational no. 60. 6. Omo ferry crossing no. 60.</p>	<p>1. Field observations/site inspections by AID 2. ERA progress reports.</p>	<p>Assumptions for achieving outputs:</p> <p>1. Adequate funds to complete const. 2. Equipment available on timely basis 3. Sufficient personnel available for const. crews. 4. Maintenance program will keep approx. 70% of equipment operational all times. 5. Off-shore equip. arr. as planned. 6. Political stability will allow const. to proceed.</p>
<p>Inputs:</p> <p>USAID: Capital to cover equipment, spare parts, hand tools, labor and recurrent costs. GOE: Equipment, supplies, facilities and salaries.</p>	<p>Implementation Target (Type and Quantity)</p> <p>USAID: Equipment & spares US\$2,100,000, recurrent cost (US\$1,900,000) to be applied on a modified FAR @ US\$8,260/km of road completed. GOE: US\$2,322,000 locally procured equipment and recurrent costs.</p>	<p>Project financial reports. Project progress reports.</p>	<p>Assumptions for providing inputs:</p> <p>AID funds available on timely basis. GOE will provide financial and human resources required.</p>

ANNEX XXI

Southern Gemu Gofa Drought Access Roads

Critical Performance Indicators

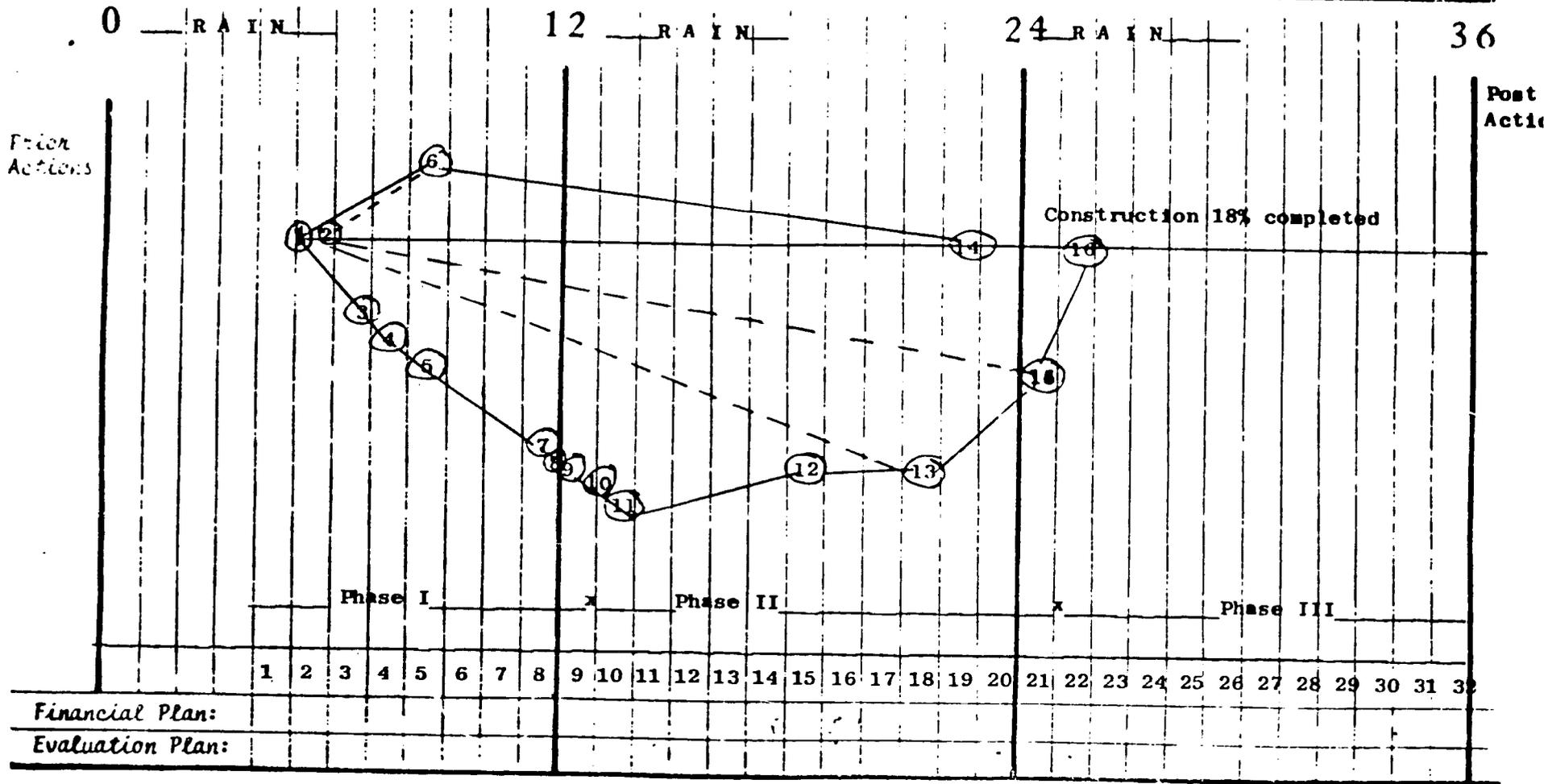
1. Grant Agreement signed, initial procurement for labor intensive project starts June 30, 1976
2. Expeditor Mechanic assigned Aug. 01, 1976
3. ERA finalized IFB Preparation Sept. 01, 1976
4. AID Review/Approval of IFB Package Oct. 01, 1976
5. Advertisement of IFB in CBD and local newspapers Nov. 01, 1976
6. Labor Intensive Construction mobilization Nov. 01, 1976
7. Receiving of bids by GOE (allowing for mailing time) Feb. 01, 1977
8. GOE request for L/Comm. Feb. 15, 1977
9. Analysis of bids by GOE, award and recommendations Mar. 01, 1977
10. AID review and approval of bid award and recommendations (L/Comm. established) Mar. 15, 1977
11. GOE to issue Purchase Order and open Letter of Credit Apr. 01, 1977
12. Equipment delivery at US port Oct. 01, 1977
13. Equipment arrival at Ethiopian port Jan. 01, 1978
14. Bailey bridge erected Jan. 01, 1978
15. Equipment delivery at Addis Ababa Mar. 01, 1978
16. Project mobilization, construction 18 percent completed by labor intensive methods Apr. 01, 1978
17. Project 65-70 percent completed Apr. 01, 1980
18. Placement of ferry completed Apr. 01, 1981
19. Project 100 percent completed July 01, 1981

PROJECT PERFORMANCE NETWORK

ANNEX XXI

Country: ETHIOPIA	Project No:	Project Title: SOUTHERN GEMU GOFA DROUGHT AREA ROADS	Date: 5/2/76	/ X / Original / / Revision #	PPI appr:
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or FI: CY	CY 1976					CY 1977					CY 1978					1979								
Month:	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb

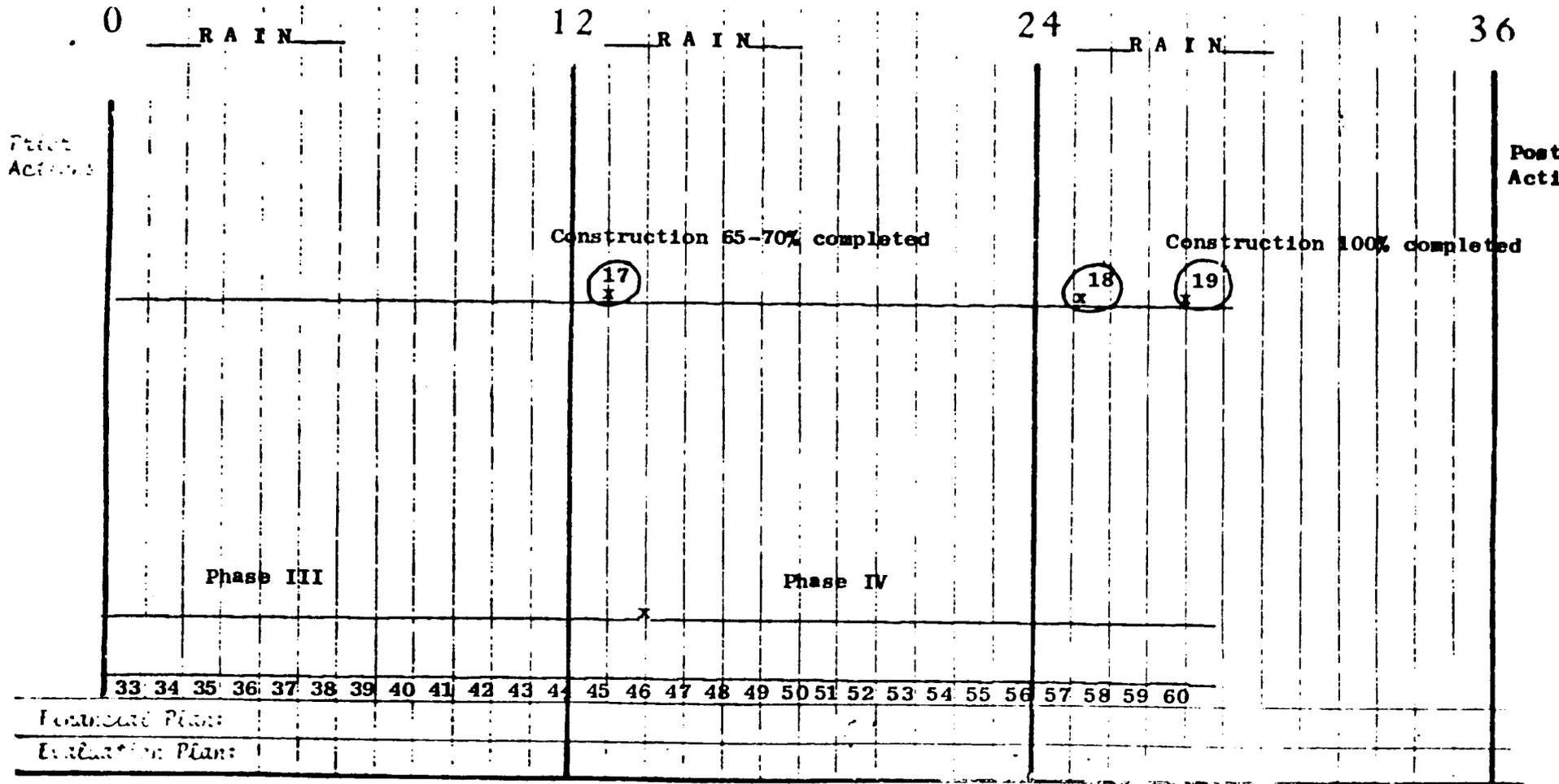


Financial Plan:
Evaluation Plan:

PROJECT PERFORMANCE NETWORK

Country: ETHIOPIA	Project No:	Project Title: SOUTHERN GEMU GOFA DROUGHT AREA ROADS	Date: 5/2/76	<input checked="" type="checkbox"/> Original <input type="checkbox"/> Revision #	PPN steps
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CY 1979												CY 1980												CY 1981											
Mar.	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb



ENVIRONMENTAL ANALYSIS - DROUGHT ROADS SOUTHERN GEMU GOFASummary

The information and conclusion presented in this environmental analysis are based on data gathered by REDSO, GOE and USAID/E representatives jointly visiting the project sites for the purpose of assessing the project and the environmental impact on the areas affected by this proposed road construction.

The Ethiopian Recovery and Rehabilitation Program signed on February 26, 1975, contained a phase referred to as Activity No. E-2. Under this phase, AID agreed to grant finance construction of about 850 kms. of rural roads. The construction costs of these roads are estimated to about \$6.80 million of which AID input is about 4.56 million and GOE contribution is about 2.24 million. The anticipated completion date of these ongoing roads projects is about December of 1977.

This new phase of the AID grant financed program is formulated after the present ongoing drought relief roads project presently under construction by Rural Roads Division (RRD) of the Ethiopian Road Authority. The goal of this activity is to further assist the GOE to provide low standard access roads to the drought affected areas of Gemu Gofa Province.

The terrain of Gemu Gofa Province is mountainous, massifs and vallyeys laying roughly from north to south. The southern part of the province contains open valleys. The mountains act as natural barriers to movement and inter-communication among the people. As a result, Gemu Gofa Province is perhaps the least economically developed area in Ethiopia, and one of the areas worst hit by the recent drought and famine.

The proposed new \$4 million grant financed project consists of constructing about 230 kms. of access road. Some of these roads exist in a form of tracks, unaccessible during the rainy season even with 4-wheel drive vehicle; not suitable for truck traffic at any time. Also to be constructed with this project are two maintenance camps, one large camp which will handle equipment repair known as "section camp", approximately 150 cross drainages, and about 20 ford stream crossings.

One 10-ton capacity ferry crossing placed on Omo River and one 25 meter baily bridge will be erected on Waito River by Ethiopian Road Authority(ERA) under a separate arrangement. AID has no input in these two items.

The standard selected for the 230 kms. access roads is only the very basic standard which will be unpassable 3 months of the year, during the heavy rains. Stone fords will be constructed where the road crosses wide streams.

Environmental Impact and Concerns

There are six major categories of environmental impact to be considered within this project. These areas of impact or concern are:

1. Effects of improved access routes into previously barely accessible areas.
2. Protection of wildlife, rangelands, migration routes, etc.
3. Effects of changes in the existing alignment concerning land-use, landmarks, archeological sites, etc.
4. Effects of improved drainage patterns.
5. Effects of air pollution from dust and increased noise level.
6. Effects of barrow pits used for roadway material.

Analysis of Impact and Concern

1. Effects of improved access routes into previously barely accessible areas:

The purpose of this road construction activity is to provide access to remote areas of Gemu Gofa Province; practically the whole part of this road project is located in the Geleb-hamer Bako Awraja. The resulting accessibility is expected:

- a. Facilitate transporting crops to markets.
- b. Extremely helpful in facilitating anti-epidemic measures.
- c. It is essential in administrative purposes and local participating in development and planning of the province.
- d. It is helpful in providing health, agricultur, education and other development projects within easy reach of people.
- e. Minimizes possiblility of drought reoccurrence.
- f. Stimulates increased cash crop and livestock production and brings more persons into the market economy.

g. Provides rural employment by using mixed labor and equipment construction method.

2. Protection of wildlife, rangelands, migration routes, etc.:

The road alignment selected for this project does not pass through an area designated for wildlife protection. However, due to nearness of the proposed road to Lake Stephenie, wildlife such as Grants, Dik-Dik, Gazelle, Baboon and various different species of birds were visible from the tracks, passable by 4-wheel drive only.

At the present, there are 4-5 vehicles per week that pass through this area. It is anticipated that traffic may increase to about 4 - 5 vehicles per day when the road is completed to Kelem. The impact of 5 vehicles per day on wildlife seems minimal and unavoidable, particularly when compared to benefits the road will bring to the drought stricken human being of the area.

3. Effects of changes in the existing alignment concerning land-use, landmarks, archeological sites, etc.:

The existing tracks, designated for improvement to rural roads standard, already exist and are passable by 4-wheel drive only during the dry season. The intention of this program is to provide normal access to these villages at least 75% of the year, cutting the necessary travel time and providing passage for drought relief trucks. The proposed changes in the vertical and horizontal alignment does not infringe upon or invalue historic sites, natural landmarks, archeological sites, etc. nor does the project destroy timberland, cropland or other resources.

4. Effects of improved drainage patterns:

The proposed alignment passes through various stream crossings which will have either a culvert or a stone/masonry ford for passing during light rains. Such minor modification of drainage facilities is not anticipated to have any major adverse effect on the environment. The disturbed areas will be established with vegetation after one rainy season.

5. Effects of air pollution from dust and increase noise level:

The proposed rural roads will be surfaced with suitable granular material; this alone is expected to reduce the dust effect. The minor noise increase generated from about 5 vehicles a day is unavoidable, but it is not expected to disrupt the environment severely.

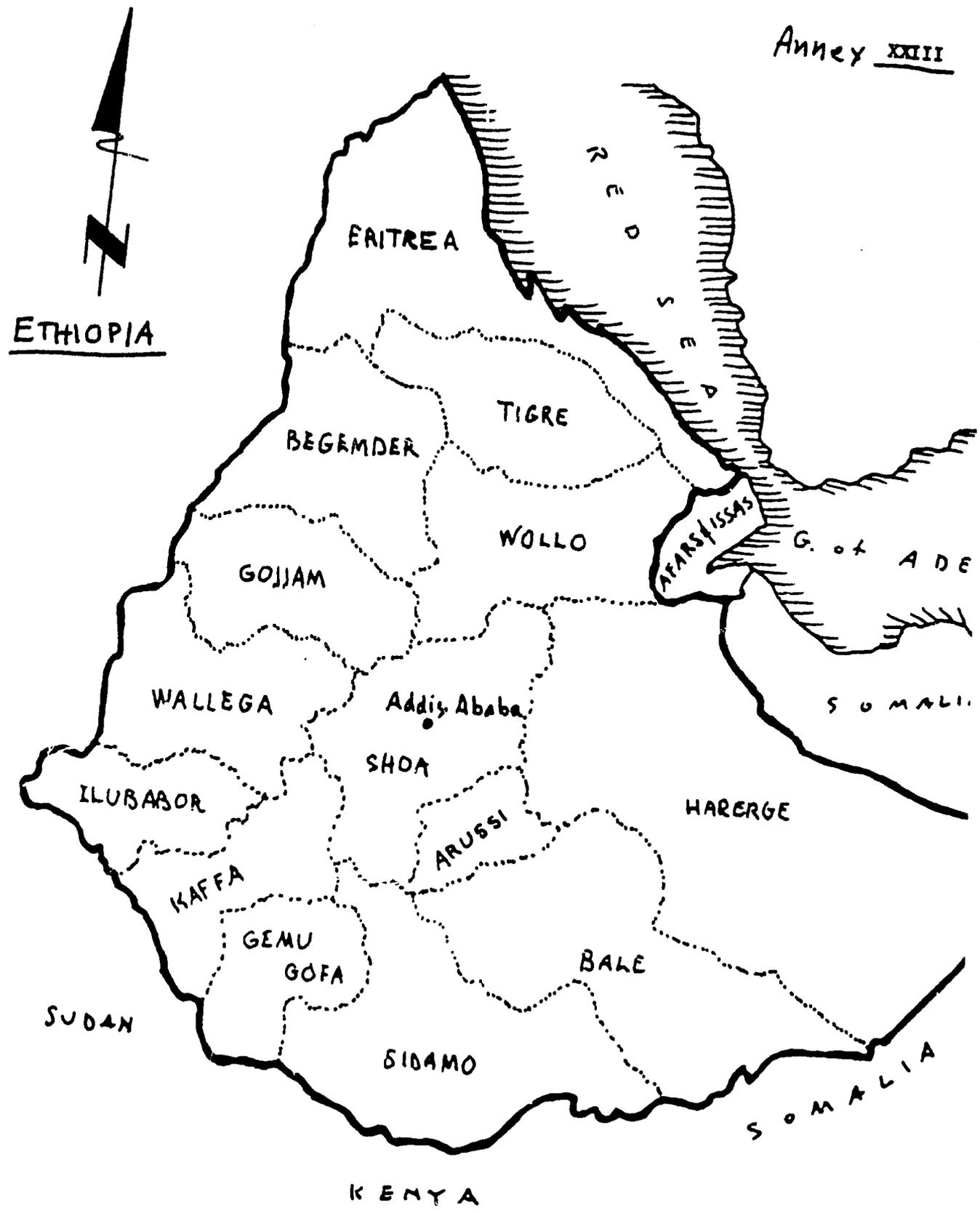
6. Effects of barrow pits used for roadway material:

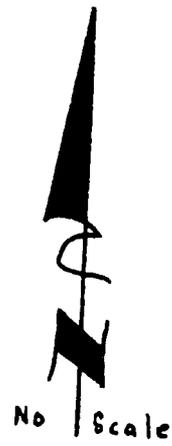
The barrow pits for surfacing this road project will be selected in

areas near mountain ranges where it is not populated. Barrow pits will ultimately be graded to drain and the natural condition will be restored. These pits are not expected to shelter malaria mosquitos or other water born insects. Therefore, this phase of the operation will also have very little impact on the environment.

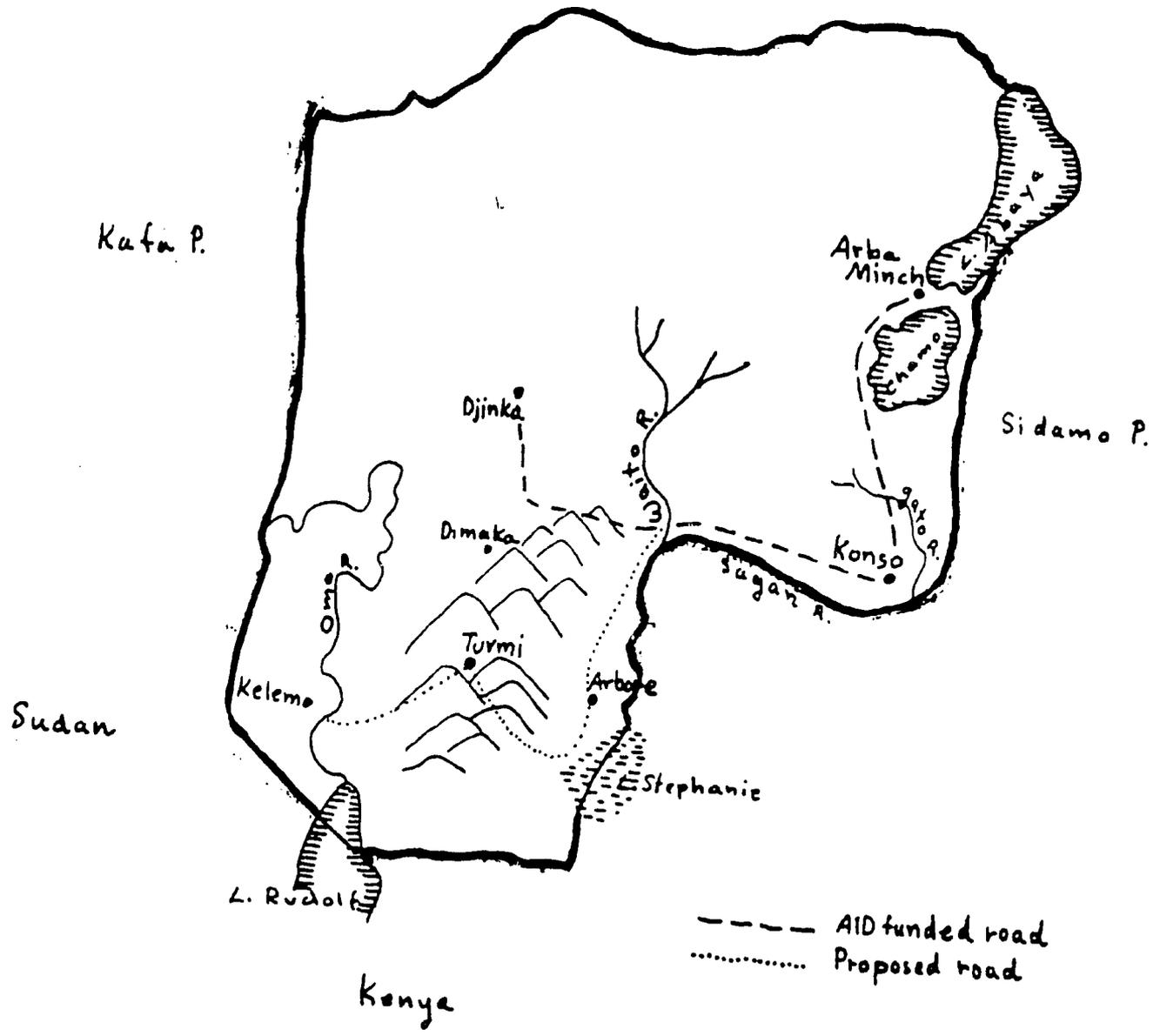
Other possible environmental impact categories suggested in the AID's Environmental Assessment Guideline Manual were carefully reviewed and found not be affected by this project. Hence, it is concluded that the overall effect of this project on the environment is positive. The construction planned in support of this project would have the usual short-term adverse effects, such as dust and noise, associated with the movement of some construction equipment. There are no natural resources committed to this project that are irretrievable or irreversible.

SUB - PROJECT TECHNICAL DETAILS





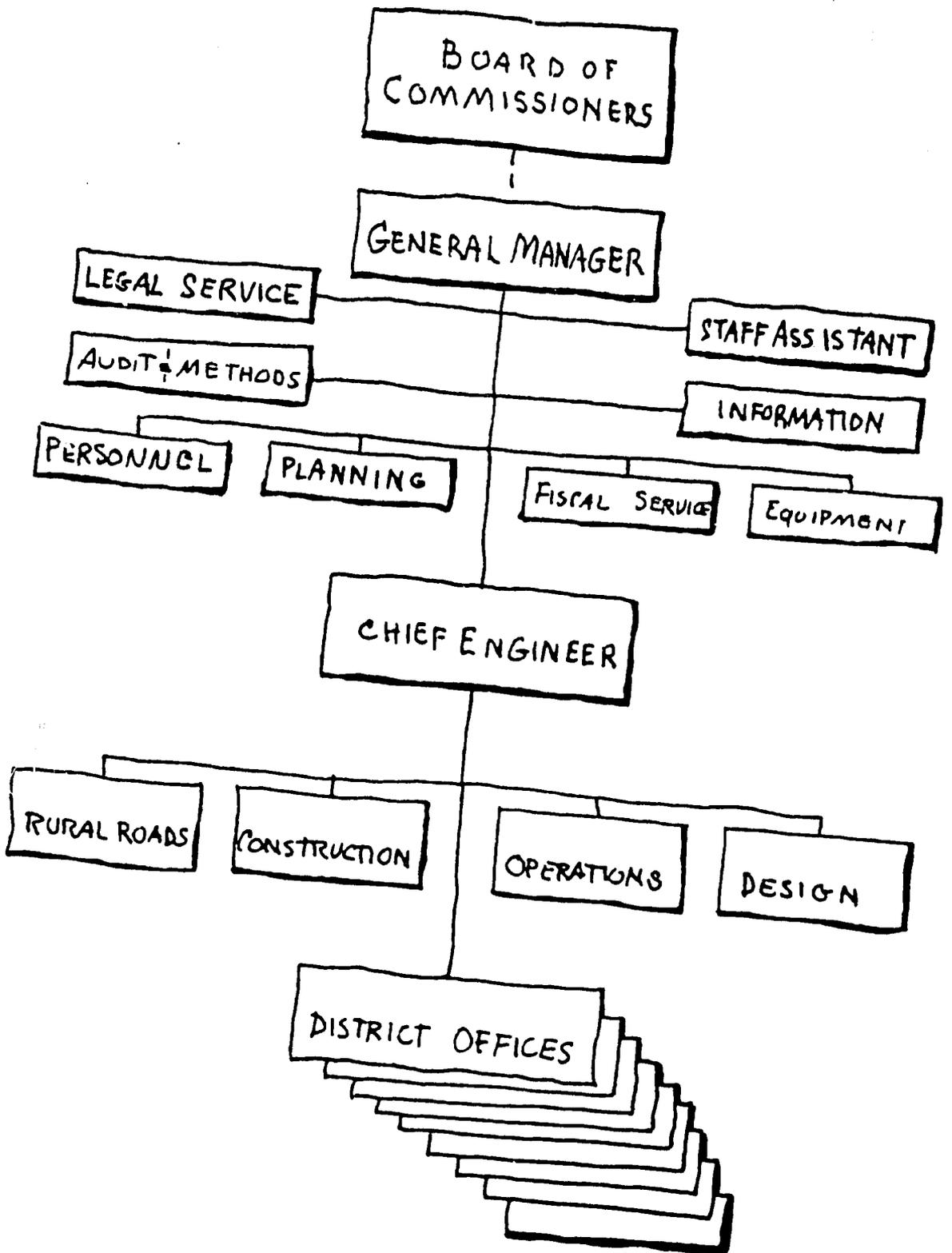
Gemu Gofa Province



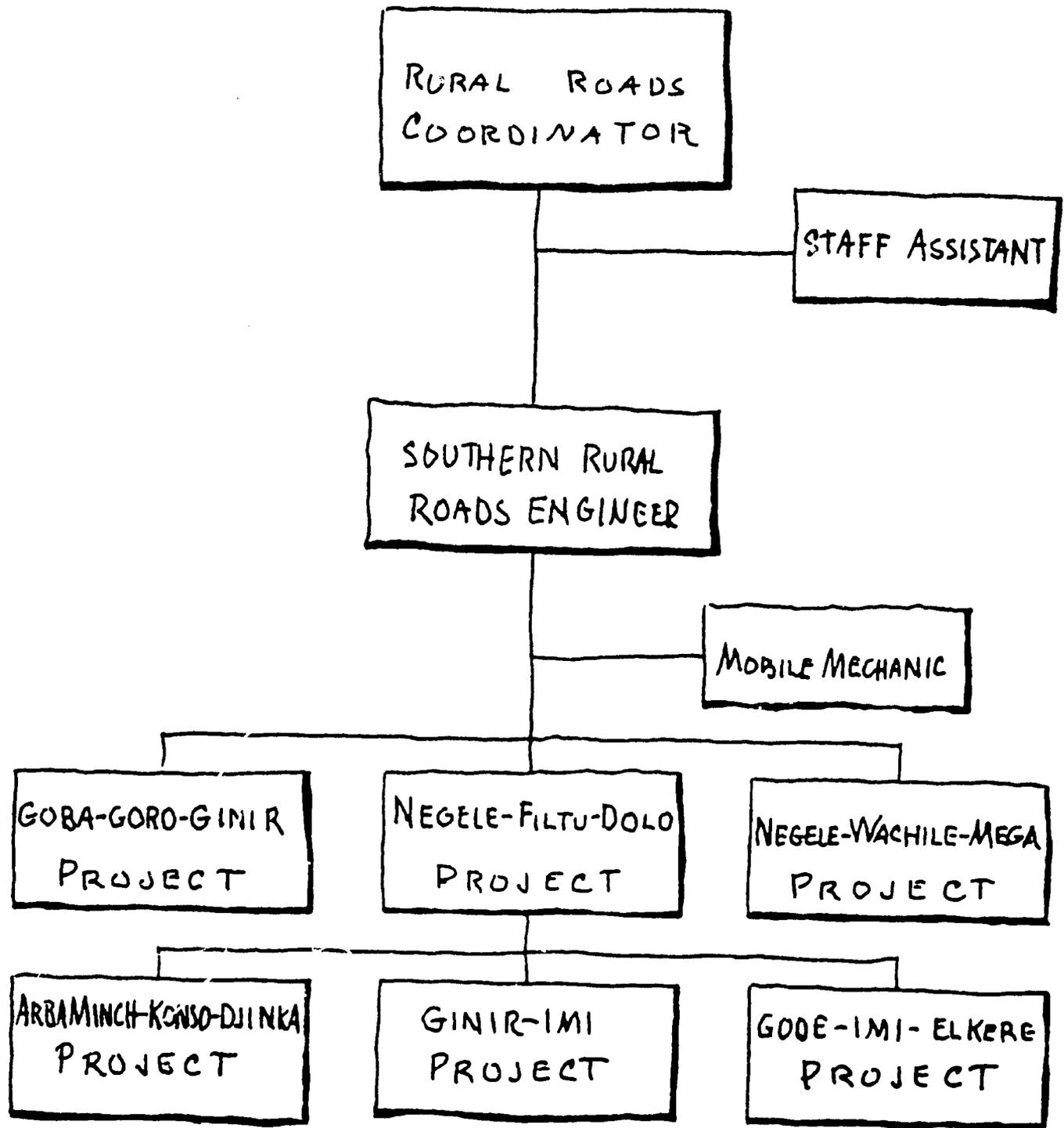
----- AID funded road
..... Proposed road

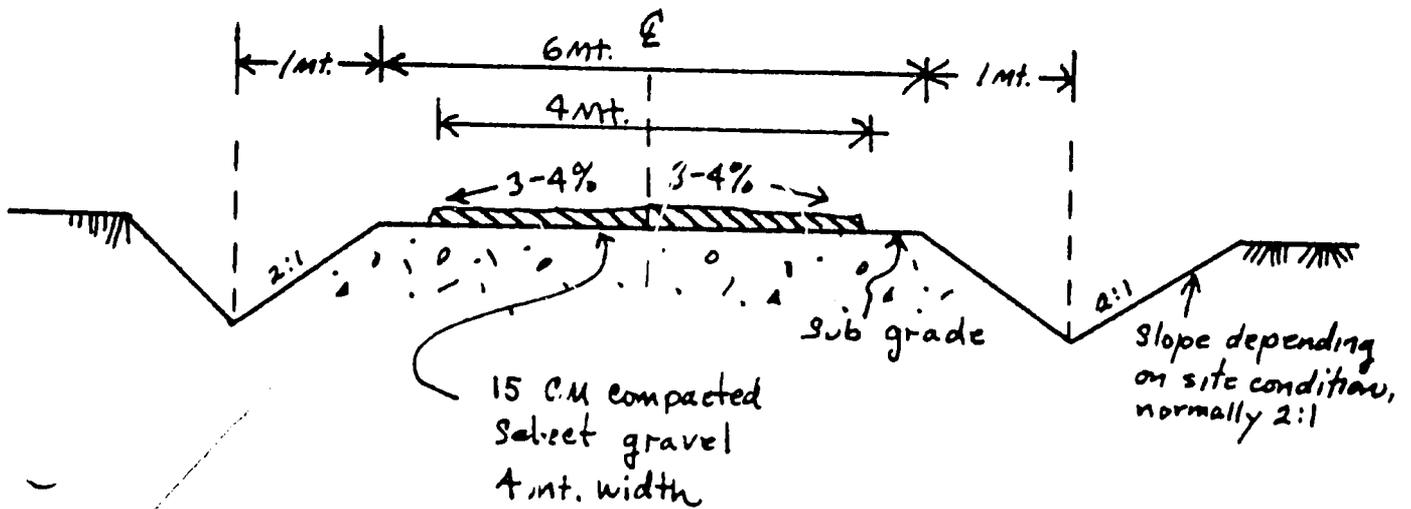
ETHIOPIAN ROADS AUTHORITY

Annex



ORGANIZATION CHART ERA RURAL ROADS DIVISION





Typical Road Cross section

Clear width: 20 mt.

Road formation: 6 mt.

Surfacing: 4 mt.

Drainage: storm furds tied with masonry wall as required; concrete pipes and masonry culverts with concrete or wooden decks depending on site conditions.

AID FINANCED EQUIPMENT

Cost Estimates

Equipment Procurement

<u>Item</u>	<u>Quantity</u>	<u>US \$ Each</u>	<u>US \$ CIF Port of Entry</u>
1. Crawler Tractor (180-HP)	2	110,000	220,000.00
2. Motor Grader (130-HP)	2	65,000	130,000.00
3. Wheel Loader (1½-cu yd)	1*	45,000	45,000.00
4. Vibro-Roller, selfpropelled (8-10 tons)	1	40,000	40,000.00
5. Vibro-Roller self-propelled (6-8 tons)	1	30,000	30,000.00
6. Water Truck, 2000-gallon	1	40,000	40,000.00
7. Mobile Workshop, tools & generator	1	90,000	90,000.00
8. Service truck/grease & fuel units, 1-ton	1	30,000	30,000.00
9. Water Pump, 60-gal per minute	2	3,000	6,000.00
10. 4-Wheel Drive Vehicle, pick-up 1-ton	2	10,000	20,000.00
11. Rubber Tired Tractor (80-HP)	3**	30,000	90,000.00
12. Tipper Trailer, 4-cu yd, towed	6**	8,000	48,000.00
13. Parts Van (enclosed)	2	15,000	30,000.00
14. Water Tanker, towed, 750-gallon	2	4,000	8,000.00
15. Fuel Tanker, towed, 750-gallon	2***	4,000	8,000.00
16. Lowboy Truck Trailor, 50-ton	1	100,000	100,000.00
17. Miscellaneous Tools	lot	80,000	80,000.00
18. Electric Generator (15 to 20-kw)	1	13,000	13,000.00
19. Flat Bed Truck (5-7-ton)	2	20,000	40,000.00
20. Welder, 300-amp, towed	1	8,000	8,000.00
21. Fuel Storage Tank, 3/4000-gallon	6+	10,000	60,000.00
22. Dump Trucks (5-7-cu yd)	6++	30,000	180,000.00
23. Dump Trucks (5-7-cu yd, 4-wheel drive)	4	35,000	140,000.00

<u>Item</u>	<u>Quantity</u>	<u>US \$ Each</u>	<u>US \$ CIF Port of Entry</u>
24. Survey Equipment, set	1	10,000	10,000.00
25. Air Compressor, Jack Hammer, Accessories (150-cfm)	1	20,000	20,000.00
26. Radios - 2 mobile and 3 stationary	5	2,000	10,000.00
Sub Total: Equipment Cost			1,496,000.00
Price escalation on equipment at 1 percent per month from April 1976 to April 1977 12 x 1 percent x 1,496,000.00 =			179,000.00
Sub Total: Equipment and Escalation			1,675,000.00
Plus 15 percent fast moving spare parts including transportation			224,000.00
Plus 12 percent escalation on spare parts			27,000.00
Sub Total: Equipment, Spares and Escalation			1,926,000.00
Plus approximately 10 percent contingency			174,000.00
Total Estimated Cost of Equipment and Spare Parts, CIF Addis Ababa, including inflation and contingencies			2,100,000.00

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- * This wheel loader is for use at the Turmi Camp area where people are nomadic and the labor is not expected to be abundant.
 - ** Loading trailers by labor, one agricultural trailer to tow one loaded trailer, while the second one is being loaded.
 - *** Two each at two construction camps, one for gasoline, one for diesel. GOE is purchasing two additional units under mobilization plan as local cost.
 - + Two each at all three camps, one for gasoline and one for diesel.
 - ++ Some long hauls are expected for surfacing materials.

GOE FINANCED OFF-SHELF EQUIPMENTCost Estimates

Minimum required equipment for mobilizing one Labor Intensive Unit at Waito on/about November of 1976.

	<u>Quantity</u>	<u>US \$ Unit Cost</u>	<u>US \$ Total Cost</u>
1. Water Truck	1	40,000	40,000.00
2. Supply Truck	1	50,000	50,000.00
3. 4-Wheel Drive Vehicle	2	15,000	30,000.00
4. Towed Water Tank (750-gallon)	3	4,000	12,000.00
5. Fuel Tank (750-gallon)	2	4,000	8,000.00
6. Generator, 15/20-kw	1	13,000	13,000.00
Total:			<u>153,000.00</u>

In addition to the above, one-half of the labor hand tools listed in Annex _____, will be required to mobilize the labor intensive construction work.

GOE FINANCED OFF-SHELF LABOR HAND TOOLS

Cost Estimates

<u>Labor Hand Tools</u>			
	<u>Description</u>	<u>Quantity</u>	<u>US \$ Cost</u>
1.	Hand Shovel	1,000	1,250.00
2.	Pick Axes	1,000	2,250.00
3.	Hoes	1,000	1,750.00
4.	Axes	500	1,375.00
5.	Wheel Barrows - heavy duty	500	19,000.00
6.	Machetes	500	500.00
7.	Crowbars	100	1,200.00
8.	Sledge, 1-kilo	200	600.00
9.	Sledge, 3-kilo	200	1,100.00
10.	Chisels	200	1,200.00
11.	Screen Mesh	10	1,000.00
12.	Carpenter Tools	lot	500.00
13.	Blacksmith Tools	lot	500.00
14.	Handles for above tools	lot	4,000.00
15.	Water Cans	50	650.00
16.	First Aid Boxes (medical)	20	500.00
	Sub Total:		<u>37,375.00</u>
	Contingency		<u>2,625.00</u>
	Total:		<u>40,000.00</u>

MAINTENANCE CAMP (ONE SITE)

Cost Estimates

	<u>Quantity</u>	<u>Unit</u>	<u>US \$</u> <u>Costs</u>
1. Fencing/Barbed Wire, 5-strand, wooden posts, area 100-meters x 100 meters	400	LM	1,200.00
2. Well Drilling/Casing	1	ea	25,000.00
3. Water Pump and Shelter	1	ea	5,000.00
4. Water Storage Tank, 1000-gallon	2	ea	2,000.00
5. Office and Warehouse (wooden poles, corrugated tin constructions, concrete floors, masonry footing) 6-meters x 12-meters	72	SM	3,600.00
6. Living Quarters (wood poles, corrugated tin constructions, dirt floors), one 6 x 20-meters twelve units 3 x 4-meters	120 144	SM SM	3,000.00 3,600.00
7. Mess Hall (as no. 6 above) 8 x 6-meters	48	SM	1,200.00
8. Electric Generator, 15.20-kw	1	ea	13,000.00
9. Furniture: Office/Warehouse, etc	1	LS	1,000.00
10. Miscellaneous	1	LS	2,000.00
Sub Total:			<u>60,000.00</u>
Contingency: approximately 10 Percent			<u>6,400.00</u>
Total:			<u><u>67,000.00</u></u>

SECTION CAMP ERECTION COST AT DIMKA

Cost Estimates

	<u>Quantity</u>	<u>Unit</u>	<u>US \$ Cost</u>
1. Fencing/Barbed Wire, 5-strand, wooden posts, area 100 x 200-meters	600	LM	1,800.00
2. Well Drilling/Casing	1	ea	25,000.00
3. Waterpump and Shelter	2	ea	5,000.00
4. Water Storage Tank, 1,000-gallon	2	ea	2,000.00
5. Electric generator, 15/20-kw	2	ea	26,000.00
6. Warehouses for Parts and Storage (wooden pole/corrugated tin constructions/concrete floors/ timber roof trusses/masonry footings) each 6 x 16-meters	96	SM	4,800.00
6 x 20-meters	120	SM	6,000.00
7. Office, Radio Room & Accounting Division (construction as No 6 above) 6 x 18-meters	108	SM	5,400.00
8. Two Bay Workshop with one end enclosed for repair/welding/ electric/tire, etc (con- struction as No 6 above) 6 x 20-meters	120	SM	6,000.00
9. Supervisory Staff Living Quarters One building with 3 rooms, toilet and shower (concrete floor, masonry footing, soft board interior walls, timber roof trusses, corrugated tin roof and exterior walls) 4 x 12-meters	48	SM	2,400.00
10. Barracks for Workers with gravity flow, shower, toilet and kitchen facilities (wooden poles, corru- gated tin construction with dirt floor) 30 units of 4 x 3-meters	360	SM	9,000.00
11. Mess Hall, 12 x 6-meters	72	SM	1,800.00

12.	Furniture for Office, Warehouse etc	1	LS	3,000.00
13.	Miscellaneous	1	LS	<u>3,000.00</u>
	Sub Total:			101,200.00
	Contingency: 10 Percent			<u>10,800.00</u>
	Total: Estimated Cost of Section Camp			<u>112,000.00</u>

GOE/ERA STAFF COSTS

<u>Personnel</u>	<u>Quantity</u>
1. Engineer II or Superintendent II	1
2. Construction Foreman II	1
3. Clerk II	1
4. Clerk I	2
5. Stock Clerk I	1
6. Clerical Aide	9
7. Clerk Typist	1
8. Equipment Operator III	6
9. Equipment Operator II	15
10. Equipment Operator I	3
11. Station Equipment Operator II	1
12. Stationary Equipment Operator I	4
13. Powderman	2
14. Dresser	1
15. Engineering Aide III	1
16. Engineering Aide II	2
17. Engineering Aide I	2
18. Mason Foreman	1
19. Mason II	1
20. Mason I	2
21. Carpenter II	1
22. Carpenter I	2
23. Labor Foreman	1
24. Labor II	1
25. Labor I	10
26. Driver	4
27. Mechanic III	1
28. Mechanic II	1

29.	Mechanic I	2
30.	Electrician I	1
31.	Welder I	1
32.	Serviceman	1
33.	Tire Repairman	1
34.	Helper	5
35.	Guard	8
		<hr/>
	Total: Personnel	97 say 100

Assume an average monthly salary of US\$ 200.00 per month per person.

US\$ 200.00 x 12 months x 4 years' average x 100 = US \$ 960,000.00

Assume 30 percent increase in wages in 5 years' time

US\$ 960,000.00 x 1.3 = US \$ 1,248,000.00

Recurrent Operation Costs

1. POL costs for one year's operation	US \$	150,000.00
Average of 3.5 years' operation - 4 x 150,000 =		525,000.00
50 percent escalation costs for POL over 5 years		265,000.00
		<hr/>
Total POL Costs		790,000.00
2. Recurrent Spare Parts Cost during life of project @ 34% (of 1,675,000.00)		585,000.00
3. Cement and Reinforcing Steel for construction of culverts		100,000.00
		<hr/>
Total : Recurrent Operation Costs	US \$	<u>1,475,000.00</u>

ERA Headquarters Support Cost

5 years x \$15,000 per year	=	US \$	<u>75,000.00</u>
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ERA Provided Spare Parts Expeditor/Merchanic

5 years x \$7,000 per year =		US \$	<u>35,000.00</u>
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Recurrent Labor Costs

Average of 500 laborers working during the five-year life of the Project

1.	500 laborers x 5 years x 240 working days a year x \$1.00 per day =	US \$ 600,000.00'
2.	Gang Chiefs, one per 10 laborers = 50 50 x 5 years x 240 days x \$ 1.50 =	90,000.00
3.	Paymaster 1 x 5 years x 12 months x \$ 1.50 =	<u>9,000.00</u>
	Sub Total:	699,000.00
	Assume about 30 percent wage increase in 5 years' time	<u>201,000.00</u>
	Total: Labour Cost	US \$ <u><u>900,000.00</u></u>

Project Cost Summary

	<u>US \$</u>
1. Cost of Equipment + 15 Percent initial spares including contingency and escalation	2,100,000.00
2. GOE Financed Off Shelf Equipment	153,000.00*
3. Section Camp cost including contingency	112,000.00*
4. Maintenance Camp cost including contingency 67,000 x 2 camps	134,000.00*
5. Cost of Labor Hand Tools including contingency	40,000.00*
6. Spare Parts Expeditor/Mechanic ERA provided	35,000.00*
7. Recurrent Labor Cost for 5 years including 30 percent wage increase	900,000.00
8. GOE/ERA staff salaries for 5 years including 30 percent wage increase	1,248,000.00*
9. Recurrent Operation Costs, POL, Construction Materials and Recurrent Spare Parts for life of project	1,475,000.00
10. ERA Headquarters Support Cost for 5 years	75,000.00
11. Inland Transportation	50,000.00*
12. Pontoon ferry	100,000.00*
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Grand Total: Construction Cost	6,422,000.00
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* denotes GOE contribution.