PD-ABE-732
79176

RURAL RECONSTRUCTION (645-0224)

PROJECT PAPER

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE: A (A = Add, C = Change, D = Delete) — Amendment Number

DOCUMENT CODE: 3

2. COUNTRY/ENTITY: Swaziland

3. PROJECT NUMBER: 645-0224

4. BUREAU/OFFICE: AFR 06

5. PROJECT TITLE (maximum 40 characters): Rural Reconstruction

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM 12 DD 31 YY 86

7. ESTIMATED DATE OF OBLIGATION (Under 'B.' below, enter 1, 2, 3, or 4)
A. Initial FY 84 B. Quarter 4 C. Final FY 84

8. COSTS ($000 OR EQUIVALENT $1 =)

A. FUNDING SOURCE	FIRST FY B. FX	C. L/C	D. Total	LIFE OF PROJECT E. FX	F. L/C	G. Total
AID Appropriated Total	39	60	99	957	293	1250
(Grant)	(39)	(60)	(99)	(957)	(293)	(1250)
(Loan)	( )	( )	( )	( )	( )	( )
Other U.S. 1.						
Other U.S. 2.						
Host Country	59	59	118	747	2111	2858
Other Donor(s)	0	0	0	250	0	250
TOTALS	98	119	217	1954	2404	4358

9. SCHEDULE OF AID FUNDING ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE 1. Grant	2. Loan	D. OBLIGATIONS TO DATE 1. Grant	2. Loan	E. AMOUNT APPROVED THIS ACTION 1. Grant	2. Loan	F. LIFE OF PROJECT 1. Grant	2. Loan
(1) FN	930B	940		0		1,250		1,250	
(2)									
(3)									
(4)									
TOTALS				0		1,250		1,250	

10. SECONDARY TECHNICAL CODES (maximum 5 codes of 3 positions each)

11. SECONDARY PURPOSE CODE

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)
A. Code
B. Amount

13. PROJECT PURPOSE (maximum 480 characters)

To assist the GOS (1) to improve its capabilities to repair and maintain unpaved roads damaged by Cyclone Domoina, and (2) to reestablish its capacity to monitor and allocate water resources.

14. SCHEDULED EVALUATIONS
Interim MM 03 YY 85 MM 11 YY 85 Final MM 12 YY 86

15. SOURCE/ORIGIN OF GOODS AND SERVICES
[X] 000 [ ] 941 [X] Local [ ] Other (Specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a ____ page PP Amendment.)

A review of the financing methods selected for implementation of this project are included in this paper, and all the methods selected are in compliance with current Agency policy.

Concurrence: Columbus Spaine
Acting Controller, USAID/Swaziland

17. APPROVED BY
Signature: R. Huesmann
Title: Director USAID/Swaziland
Date Signed: MM 08 DD 10 YY 84

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

AID 1330-4 (8-79)

ACTION MEMORANDUM FOR THE DIRECTOR

FROM: ALAN A. SILVA, REGIONAL PROJECT DEVELOPMENT OFFICER

SUBJECT: SWAZILAND - RURAL RECONSTRUCTION PROJECT (645-0224)

PROBLEM

Your approval is requested to execute a grant of $1,250,000 from the FAA Sec. 103 Food and Nutrition appropriation to the Government of Swaziland (GOS) for the Rural Reconstruction Project (645-0224). It is planned that the full amount will be obligated in FY 1984.

DISCUSSION

The purpose of this project is to assist the Government of Swaziland to improve its capacity to repair and maintain unpaved roads damaged by Cyclone Domoina and to reestablish its capacity to monitor and allocate river water resources.

Cyclone Domoina, January 28 to 31, 1984, caused over $49,000,000 worth of damage in Swaziland. About $37 million will be needed to restore road and bridge infrastructure to the conditions existing prior to Domoina. This rehabilitation effort is the most pressing concern of the Government and represents its highest development priority. The Roads Branch of the Ministry of Works and Communications has prepared a listing of priority projects. These have been submitted to foreign donors for possible funding. The GOS is also using substantial amounts of its own funds.

The project represents AID's longer-term, measured response to the disaster and follows our initial contributions for the emergency relief effort ($25,000), for repairs of clinics ($135,000) and for the rehabilitation of small-scale irrigation enterprises ($250,000). Disaster rehabilitation is in keeping with U.S. policy to assist in recovery from natural calamities.

The project is consistent with and supportive of the Country Development Strategy Statement (CDSS). USAID has sponsored the training of Swazi engineers and this project enhances their professional development through supervisory, design, and planning experience under U.S. supervisory engineers. The project establishes a system for the contracting out to private sector firms of repair and maintenance of Roads Branch plant and equipment. This encourages trends toward the use of the private sector for those activities it can more effectively accomplish. The rehabilitation of rural gravel and earth roads will reduce the current cost of transporting agricultural inputs and farm production, increasing profitability for both the small and large-scale farmers and the firms supplying seeds, fertilizers, and pesticides. The water resources component will assist in the expansion of small-scale irrigated schemes.

The direct beneficiaries of the project will be the three Swazi engineers, who will receive on-the-job training; the Roads Branch, which will have, in place, a system to rehabilitate its disaster damaged rural gravel and earth roads; and Central Transport Administration (CTA), which will have time-and-materials contracting systems established for the repair and maintenance of rehabilitation-related plant and equipment. The contracting mechanism will benefit private sector firms by providing at least $2.0 million in contracted repair services and by reaffirming the validity of contracting out major GOS functions. The water resources component will benefit current and future rights-holders (commercial agricultural users, power generating facilities, and small-scale irrigating farmers) and allow increased internal exploitation of river water resources after satisfying international commitments.

Indirectly, the farmer will ultimately benefit. The increased profitability will result from the lowering of input and output transport costs plus the more timely availability of agricultural inputs. The rehabilitation effort favorably impacts all rural society by encouraging the increased flow of goods, services, and people. Access to clinics, schools, government offices, and small rural commercial centers will be increased. The project benefits those who seek to increase agricultural production by new or expanded irrigation schemes, thereby increasing commercialization with its rural employment generation effects.

The total project cost is estimated at $4,358,000; AID is providing $1,250,000 million, the United Kingdom (via ODA) is providing $250,000 in technical assistance (two engineers for two years each) and the GOS is providing $2,858,000. Financial commitments are disaggregated as follows:

A. For the Roads Rehabilitation Component:

1. U.S. Input
   a. U.S. technicians (two engineers for two years each) -$500,000
   b. U.S. short-term (five person-months) technical assistance - $65,000
   c. U.S. participation in vehicles maintenance contracting - $500,000

   Sub-total: U.S. funding $1,065,000

2. U.K. Input
   U.K. technicians (two engineers for two years each) - $250,000

   Sub-total: U.K. funding $250,000

3. GOS Input
   GOS Roads Branch rehabilitation units operations (4 units for 2 years) - $2,714,000

   Sub-total: GOS funding: $2,714,000

Total, Roads Rehabilitation Component: $4,029,000

B. For the Water Resources Component:

1. U.S. Input
   a. U.S.-financed short-term technical assistance - $12,000
   b. U.S. strip-chart recorders - $54,000
   c. U.S.-financed telemetry devices - $28,000
   d. U.S.-financed instrument-housing towers - $91,000

   Sub-total, U.S. funding: $185,000

2. GOS Input
   GOS-financed weir construction - $144,000

   Sub-total, GOS funding: $144,000

Total, Water Resources Component $329,000

Of the U.S. contribution, $173,000 (14 percent) represents commodity procurement, while the remainder deals with technical assistance of various types. These include short-term consultancies, $77,000 (6 percent); long-term supervisory engineers, $500,000 (40 percent); and time-and-materials maintenance and repair contracts, $500,000 (40 percent).

AID will contribute, therefore, some 29 percent of total project cost. The project leverages more than twice the U.S. contribution in GOS commitments to maintenance service contracting, salaries of counterparts, and operating expenses of the rehabilitation units. Our assistance will approximately match the GOS financing for construction of weirs and installation of U.S.-financed equipment related to the water resources component.

The internal rate of return for the regraveling efforts will be in excess of sixteen percent. Repair and maintenance for equipment work can be done more efficiently and cost-effectively by private sector contractors. Lastly, the reestablishment of the GOS ability to monitor river flow is necessary to permit additional allocations of river water for irrigation purposes.

While the GOS budget is tighter than in previous years, the Government has less debt than most other countries. It is endeavoring to improve its situation by imposing a sales tax.

As this project will contribute to the rehabilitation of roads infrastructure and revitalization of water resources management, it will benefit all sectors of society in a return to the situation extant prior to Cyclone Domoina. The restoration of infrastructure to conditions existing prior to Domoina will improve the general quality of life; provide freer movement of goods, services, and people; reduce isolation and economic dislocations; and increase access to public facilities and private markets. In short, the project is socially sound and will benefit the totality of Swazi society.

There are no serious human rights issues recognized by the U.S. Government with regard to Swaziland which would preclude this project.

The project is technically sound, as it addresses the two major constraints identified in earlier relief and emergency reconstruction efforts: specifically, the lack of qualified, supervisory engineering skills and the low operational availability of plant and equipment assigned to the Roads Branch. The U.S. supervisory engineers and the British engineers will provide both the technical expertise and supervisory engineering abilities needed to provide Swazi engineers with on-the-job training, and to execute a rapid road rehabilitation effort. The establishment of a contracting mechanism, with the direct responsibilities of the supervisory engineers over the total vehicle maintenance program, and the close liaison with CTA to ensure prompt payments of contractors, will result in less deadlined equipment.

As regards water resources equipment, AID will be replacing equipment to specifications which had permitted accurate and timely monitoring of river flows since 1953. The Water Resources Branch has constructed weirs in the past and has the supervisory staff to administer contracts to expedite replacement of weirs. Thus, this component of the project is technically feasible as well.

The PID recommendation of a negative determination, as regards the Initial Environmental Examination, has been concurred in by the Africa Bureau Environmental Officer; no additional environmental analyses are necessary. The decision was based on the nature of the project - to rehabilitate or reconstruct roads or gauging stations which currently exist. The project will merely rehabilitate those structures, not create new ones. Furthermore, the GOS has current

standards which require that borrow pits be restored, as much as possible, to their conditions prior to road work. The reconstruction of drainage sections through the project will have a beneficial impact in decreasing erosion.

The Project Agreement contains two non-standard conditions precedent to disbursement:

(1) Evidence that the supplementary plant and equipment necessary to the successful implementation of the project have been procured, transferred from other ministerial units, leased, or will otherwise be made available to the Roads Branch of the Ministry of Works and Communications when needed during the life of this project;

(2) Evidence that the Ministry of Works and Communications will enter into work agreements specifying the responsibilities and authority of the two U.S. supervisory engineers provided under this project;

and two special covenants:

(1) The Cooperating Country agrees to present to Parliament a budget for the rehabilitation units of the Ministry of Works and Communications and for the repair and replacement of weirs for river gauging stations of the Ministry of Natural Resources, Land Utilization and Energy for the fiscal year starting April 1, 1985 which is at least equal to the amount spent by such units in the 1984/85 fiscal year;

(2) The Cooperating Country agrees to pay promptly, through the Central Transport Administration, the bills submitted under the plant and vehicle maintenance and repair contracts.

These appear in the attached project authorization. The major implementing agencies of this project are the Roads Branch of the Ministry of Works and Communications, the Central Transport Administration, and the Water Resources Branch of the Ministry of Natural Resources, Land Utilization and Energy.

Of the $1.25 million in U.S. financing, approximately $540,000 may require source/origin waivers ($28,000 for telemetry devices for water gauging stations, $500,000 for the vehicle maintenance service contracts and $12,000 for the weir reconstruction technical consultancy). An additional $82,000 (for recorders and telemetry equipment) will require sole source waivers. Source/origin and sole source waivers for the $18,000 in telemetry devices and a sole source waiver for $54,000 in strip-chart recorders are ready for your approval. Other individual waivers will be processed, as contracts are awarded and nationality of firms are established, to

permit procurement from the Republic of South Africa, the United Kingdom, or other free world nations, pursuant to the Mission Director's delegated authority contained in DOA14C, as revised.

On August 9, 1984, USAID/Swaziland held a Project Review of the Rural Reconstruction Project chaired by the Deputy Mission Director. The Implementation Plan was carefully reviewed; the committee concluded that the plan was realistic, providing a reasonable time frame for executing the project. Consequently, the committee has recommended approval of the Project.

A final Project Review was held in Nairobi, Kenya with the REDSO/ESA Project Committee. The Committee, chaired by the REDSO/ESA Director, concurred in the project. Such concurrence was received by cable NAIROBI 26066, dated August 27, 1984.

As noted in the Monitoring Plan, the USAID/Swaziland Agricultural Development Officer will serve as the AID Project Officer for the Rural Reconstruction Project, and as such, will have primary USAID/Swaziland responsibility for the monitoring and evaluation of the project. Engineering backstopping will be undertaken by the USAID/Lesotho Regional Engineer, with secondary assistance as necessary from the REDSO/ESA engineering staff. As this is a new project, the Congress must be advised pursuant to Congressional Notification procedures. A Congressional Notification, indicating the intent of USAID/Swaziland to authorize this project with a proposed FY1984 obligation level of $1.25 million, was transmitted to the Congress on July 26, 1984. The waiting period expired on August 10, 1984; the project may now be authorized.

RECOMMENDATION

That you sign the attached Project Authorization and thereby approve funding of $1,250,000 which will be totally obligated in FY1984.

APPROVED: R Bresma

DISAPPROVED: _____

DATE: 8/28/84

Clearances:
USAID/S/DD:JOPhilpott
USAID/S:RLA:GBBisson
USAID/S/CONT:CSpaine 8/4/84
USAID/S/ADO:PADaly 8/23/84
USAID/S/R/ECON:NCohen 8/24/84
USAID/S/A/PRM:WHammink 8/30/84

UNITED STATES OF AMERICA
AGENCY FOR INTERNATIONAL DEVELOPMENT
U.S. AID MISSION TO SWAZILAND
P.O. BOX 750, MBABANE, SWAZILAND
TEL. 22206

August 29, 1984

PROJECT AUTHORIZATION

Name of Country: Swaziland
Name of Project: Rural Reconstruction
Number of Project: 645-0224

1. Pursuant to Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Rural Reconstruction Project for Swaziland (the "Cooperating Country") involving planned obligations of not to exceed $1,250,000 in grant funds over a one year period from the date of authorization, subject to the availability of funds in accordance with the AID/OYB allotment process, to help in financing foreign exchange and local currency costs of the project. The planned life of project is two years and four months from the date of initial obligation.

2. The project consists of assistance to the Cooperating Country to rehabilitate and reconstruct roads and related infrastructure and to re-equip and replace water gauging stations destroyed by Cyclone Domoina. Specifically, the grant will consist of two components:

   A. roads rehabilitation:

      (1) engineering assistance (for supervision of restoration works and on-the-job training of Swazi engineers) to develop supervisory and quality-control capacities within the Roads Branch of the Ministry of Works and Communications;

      (2) maintenance, service and materials contracts to minimize non-operational status of plant and equipment; and

      (3) short-term technical assistance to resolve site-specific engineering problems and review project performance; and,

   B. water gauging station restoration:

      (1) procurement of towers, strip-chart recorders and telemetry equipment, and

      (2) technical consultations.

3. The Project Agreement which may be negotiated and executed by the officer to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority shall be subject to the following essential terms and covenants and major conditions, together with such terms and conditions as A.I.D. may deem appropriate.

4. A. Source and Origin of Commodities; Nationality of Services

Commodities financed by A.I.D. under the project shall have their source and origin in the Cooperating Country or in the United States, except as A.I.D. may otherwise agree in writing. Except for ocean shipping, the suppliers of commodities or services shall have the Cooperating Country or the United States as their place of nationality, except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D. under the project, except as A.I.D. may otherwise agree in writing, shall be financed only on flag vessels of the United States.

B. Conditions Precedent to First Disbursement

Prior to the first disbursement under the Grant, or to the issuance by A.I.D. of documentation pursuant to which disbursement will be made, the Cooperating Country will, except as the Parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D.:

(1) A statement of the name of the person holding or acting in the office of the authorized representative of the Cooperating Country and of any additional representatives, together with a specimen signature of each person specified in such statement;

(2) Evidence that the supplementary plant and equipment necessary to the successful implementation of the project will be procured, transferred from other ministerial units, leased, or will otherwise be made available to the Roads Branch of the Ministry of Works and Communications when needed during the life of this project;

(3) Evidence that the Ministry of Works and Communications will enter into work agreements specifying the responsibilities and authority of the two U.S. supervisory engineers provided under this project.

C. Special Covenants

(1) The Cooperating Country agrees to present to Parliament a budget for the rehabilitation units of the Ministry of Works and Communications and for the repair and replacement of weirs for river gauging stations of

the Ministry of Natural Resources, Land Utilization and Energy for the fiscal year starting April 1, 1985 which is at least equal to the amount spent in the 1984/85 fiscal year.

(2) The Cooperating Country agrees to pay promptly, through the Central Transport Administration, the bills submitted under the plant and vehicle maintenance and repair contracts.

D. Pre-Grant Agreement Costs

Pre-Grant Agreement expenditures incurred by the Cooperating Country for technical assistance related to the design and construction of weirs and for the procurement of towers, recorders, and telementry equipment, based on commitments made after January 31, 1984 and arising as a direct result of Cyclone Domoina, are authorized to be reimbursed under the Grant Agreement.

R. Huesmann

Robert Huesmann
Director of USAID/Swaziland

Clearances:

RE:RAdams	draft	date 7/20/84
RLA:GBBisson	GBB	date 8/27/84
R/ECON:NPCohen		date 8/27/84
ADO:PDaly		date 8/27/84
A/PRM:WHammink		date 8/27/84
RPDO:AASilva	draft	date 8/09/84
A/CONT:CSpaine	CS	date 8/27/84
DD:JOPhilpott		date 8/ /84

Concurrence:
DIRECTOR, REDSO/ESA:JWKoehring: Cable NAIROBI 26066, dated Aug. 27, 1984

Rural Reconstruction (645-0224)

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I. SUMMARY PROJECT DESCRIPTION

A. Cooperating Country

The Cooperating Country receiving the grant is the Government of Swaziland (GOS).

B. Implementing Agencies

The GOS implementing agencies are:

- the Roads Branch, Ministry of Works and Communications
- the Central Transport Administration, and
- the Water Resources Branch, Ministry of Natural Resources, Land Utilization and Energy.

C. Financial Plan and Terms of the Project

The project is a grant of $1,250,000 to the Government of Swaziland, to be obligated entirely in FY 1984 from Section 103 (Food and Nutrition) funds. The project will be implemented over a period of two years, from FY 1984 through FY 1986.

($000)

COMPONENT	AID	UK	SWAZILAND	TOTAL
A. Rural Roads Rehabilitation				
1. Long-Term Technical Assistance	500	250	-	750
2. Short-Term Technical Assistance	65	-	-	65
3. Repair/Maint. Contracts	500	-	1,446	1,946
4. Other Vehicle Expenses (GOS)	-	-	15	15
5. Personnel Costs (GOS)	-	-	1,216	1,216
6. Other Support Costs (GOS)	-	-	37	37
Sub-Total	$1,065	$ 250	$2,714	$4,029
B. Water Gauging Station Rehabilitation				
1. Water Gauging Equipment	173	-	-	173
2. Short-Term Technical Assistance	12	-	-	12
3. Weir Reconstruction	-	-	144	144
Sub-Total	185	0	144	329
TOTAL	$1,250	$ 250	$2,858	$4,358

D. Purposes of the Project

The purposes of the project are to assist the GOS (1) to improve its capabilities to repair and maintain unpaved roads damaged by Cyclone Domoina and (2) to reestablish its capacity to monitor and allocate river water resources.

E. Background of the Project

As of January 1984, Swaziland had a comprehensive road system, approximately 23 percent of which was paved. Its capital budget allowed continued paving of roadway each year; its recurrent budget provided for regraveling and hard-top maintenance on a five-year schedule. The road network has had a very high priority in the budget of the Government of Swaziland. GOS surface water resource monitoring, operational since 1953, has expanded in number of stations and has become increasingly sophisticated.

By February 1, 1984, Cyclone Domoina had resulted in extensive flooding, the return frequency of which was greater than 200 years. Years of development progress in roads, other infrastructure, and water resources monitoring stations were washed away.

Damages caused by Domoina approximate $49,000,000; in terms of repair costs, the most seriously impacted sectors were roads and bridges, with 68 percent of the damages ($33.2 million) and railways, with 21 percent ($10.2 million). Although damage was small in dollar terms ($400,000), 80 percent of the river gauging stations were affected, resulting in a proportionately greater reduction of the capacity to monitor correct apportionment of river water use rights.

The GOS, mobilizing its Ministries of Works, Natural Resources, and Agriculture, undertook immediate emergency repairs on roads to facilitate relief and rehabilitation work. During the first month, pledges of more than $1.5 million were received from governments, relief organizations, and religious groups from all corners of the Free World. The United States committed $160,000 from Disaster Assistance Funds ($25,000 for relief and $135,000 for health clinic repairs) and reprogrammed $250,000 from a rural development grant to small-scale irrigation repairs.

By April, the GOS had developed a list of 23 discrete road and bridge projects, totaling some $37.2 million for funding by the GOS, Development Banks or foreign donors. Expressions of interest from the United Kingdom (Big Bend Bridge, $3.5 million) and the African Development Bank (Mkhondvo-Mahamba Road, $3.5 million) are being explored. An August 1984 pre-appraisal mission from the World Bank is expected to assist through a $20 million loan. The GOS is soliciting other concessional and commercial lenders to rehabilitate its road and bridge network.

Through its own personnel and complementary budgetary resources, the GOS will rehabilitate 500 miles of unpaved roadway in two years, through the redirection of its three regraveling units to rehabilitation work. The more extensive nature of this work will require experienced supervision and wider use of plant and equipment.

The first months of the rehabilitation efforts demonstrated the need for experienced and qualified supervisory engineering and the need for greater availability of plant and equipment. Given the reconstruction nature of the project, quality control and testing for road standards has become increasingly important to ensure that failed roadways are rehabilitated to standard.

F. Description of the Project

The project consists of two components: rural roads rehabilitation and water gauging station restoration. The project will provide long-term engineering personnel services, up to five months of short-term engineering consultancies for road site-specific assessment and up to three months of assistance for weir reconstruction design and site planning. There will also be a series of time-and-materials contracts for the repair and maintenance of plant and equipment; these will be both to overhaul all deadlined equipment within the first four months of the project and to provide parts and services to repair and maintain equipment which can not be adequately dealt with by the Central Transport Administration (CTA). Finally, the project will provide water gauging equipment.

Technical assistance accounts for 46 percent of the project; assistance in the form of time-and-materials maintenance contracts will amount to an additional 40 percent. Equipment purchases account for the balance of the project costs.

The rural roads rehabilitation component will secure the services of two engineers (for two years each at a total cost of $500,000) to supervise the efforts of the rehabilitation units and to provide on-the-job training for three Swazi engineers. These two supervisory engineers will direct work in all four districts of the country. The Central Transport Administration will assign field mechanics to the mobile repair units, and they will operate under the direction of the supervisory engineers. Thus, the U.S. engineers are the critical element in this component: they will enhance the professional experience of Swazi engineers, integrate inspection concepts and personnel into the roads rehabilitation effort, and manage the personnel and equipment of the rehabilitation units. They will also be responsible, in the first instance, for the operational availability of plant.

The second equally important element in the restoration of the roads network is the contracting out of repair and maintenance work which is beyond the capacities of CTA to undertake on a timely and effective basis. Service contracts will be awarded for the immediate overhaul of deadlined equipment and for the longer-term repair of inoperative equipment during the life of the project. The contract will also allow procurement of expendable supplies or spares from the contractor when such are not available from CTA within five work days. The contracts will be accessed by work orders/requisitions signed by the supervisory engineer and the Chief Mechanical Engineer of CTA. Payment will be made promptly by CTA upon signature of the supervisory engineer and General Transport Manager (of CTA) but in not less than 30 days unless the quality of the work is disputed. Maximum AID commitment to the contracts is $500,000; the GOS share of the contracts will be at least double that amount.

To ensure adequate engineering planning and design experience in the rehabilitation of roads, short-term consultants may be required for site-specific problems. The complexity and magnitude of Domoina's destruction yielded complicated sets of rehabilitation problems in some segments of damaged roadway. Their resolution may necessitate specialized expertise beyond the ability of the project's supervisory engineers. Approximately five person-months ($65,000) of such expert consultancies and related project review have been allowed.

The second component of the project will provide water depth and volume gauging equipment at river measuring stations. Specifically, the project will finance the repair or replacement of all eighteen strip-chart recorders ($56,000) and the three telemetry devices ($17,000) destroyed in the Domoina floods; in addition, it will finance the fabrication and installation of nineteen towers ($100,000) used to house such equipment at weirs sites. The costs of reconstructing or repairing the weirs will be paid by the GOS by either using its own manpower or seeking contractors. AID will provide $12,000 for consultants to relocate demolished weirs, design replacement weirs, and prepare tender documents.

G. Summary Findings

It has been concluded from the analyses in the Project Paper that:

(1) the project approach is technically and economically sound, socially acceptable and administratively feasible;

(2) the design and cost estimates are reasonable and adequately planned;

(3) the timing and funding of project activities are appropriately scheduled;

(4) sufficient planning has been done for monitoring and evaluation of the project; and,

(5) all statutory criteria have been satisfied.

H. Project Issues

No issues in addition to those raised in the PID ECPR (see PID Approval Cable, Annex A) have arisen during the PP design. The issues raised during the ECPR have been fully addressed in the Project Paper to the satisfaction of USAID.

I. Required Waivers

Source/origin and sole source waivers for the telemetry devices and a sole source waiver for the strip-chart recorders are ready for your approval. Other individual waivers will be processed, as contracts are awarded and nationality of firms are established, to permit procurement from other countries as required.

J. Major Conditions Precedent and Special Covenants

The two non-standard conditions precedent to initial disbursement under the grant address staffing and equipment concerns of the rural roads rehabilitation efforts. The first CP will require that the GOS provide evidence that the Ministry of Works and Communications will enter into work agreements specifying the responsibilities and authority of the two U.S. supervisory engineers provided under this project. Second, that the GOS shall present evidence that the supplementary plant and equipment necessary to the successful implementation of the project has been procured, transferred from other ministerial units, leased or will otherwise be made available to the Roads Branch of the Ministry of Works and Communications when needed during the life of the project.

The two covenants proposed address financial concerns. First, the GOS will undertake to provide at least the same level of financial resources to the rehabilitation efforts of the Roads Branch and the Water Resources Branch in the GOS' FY1986 as it did in FY1985. Second, the GOS, through its CTA payment agent, will ensure prompt payment of maintenance contractors.

K. Project Design Team Members

The project design team members included:

Gary Byllesby, Controller, USAID/S
Gary Bisson, Regional Legal Advisor for Southern Africa, USAID/S
Neal Cohen, Regional Economist for Southern Africa, USAID/S
Paul Daly, Agricultural Development Officer, USAID/S
Alan Silva, Regional Project Development Officer, USAID/Zimbabwe, (Team Leader)
Columbus Spaine, Acting Controller, USAID/S
Robert Adams, Regional Engineer, REDSO/ESA

II. PROJECT RATIONALE AND DESCRIPTION

A. Nature of the Problem

From January 28 to 31, 1984, Mozambique, South Africa (Natal and Transvaal Provinces), and Swaziland were struck by Cyclone Domoina, an unusually intense storm which provided the heaviest continuous rainfall ever recorded in Swaziland. At any given point in the country, the amount of rainfall received is unlikely to be equaled in 100 to 200 years. With the whole nation being simultaneously affected, flooding caused in catchment areas suggests a flood return period in excess of 200 years. River velocities of 23 feet per second were observed; estimates from South Africa (for a catchment of 2,940 square miles) put flows at 20,000 cubic meters per second, about five times the design flood stage. The severity of Domoina, as compared to previous two-day maximum rainfalls, is shown below.

CYCLONE DOMOINA: RAINFALL RECORDED AND COMPARISON TO PREVIOUS LEVELS

STATION	ANNUAL AVERAGE RAINFALL (inches)	TWO-DAY PREVIOUS MAXIMUM (inches)	CYCLONE DOMOINA RAINFALL (inches)	PERCENT OF PREVIOUS TWO-DAY MAXIMUM	PERCENT OF TOTAL ANNUAL AVERAGE RAINFALL
MBABANE (from 1903)	55.1	11.2	20.0	179	36
PIGGS PEAK (from 1903)	48.4	16.1	35.7	222	74
SITEKI (from 1899)	33.8	11.7	26.3	225	78
MPISI (from 1952)	29.0	5.5	14.1	256	49
MATSAPA/MANZINI (from 1897)	36.1	13.5	13.9	103	39
BIG BEND (from 1922)	22.2	6.1	13.9*	228	63

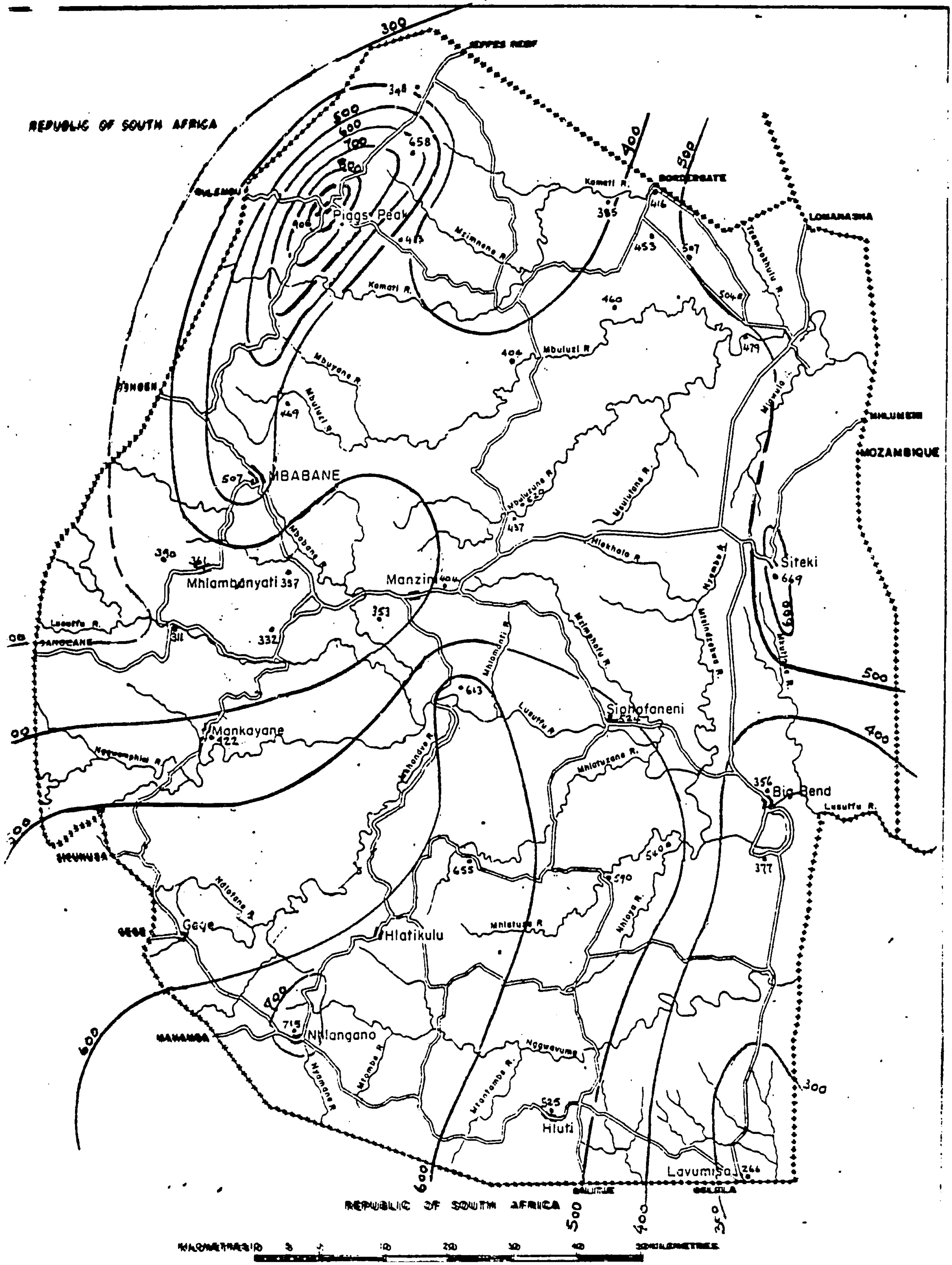
* The gauge at the Sugar Estate overflowed; thus rainfall reported is underestimated.

The resultant extreme flooding conditions, swelling rivers beyond their banks and inundating low-lying areas, exacted a heavy toll in lives (some 65 persons dead or missing) and wreaked havoc on Swaziland's relatively comprehensive road and rail transport system. Many vital links were severed along the 1,700 miles of road; parts of railway lines and many bridges were swept away. The downpour on the hilly Swaziland terrain with its highly erodable soils quickly clogged the hundreds of road drains with soil, rock and other debris causing the erosion of bridge approaches, culverts, and surface drainage systems.

SWAZILAND

CYCLONE "DOMOINA" 28 JAN TO 1 FEB 1984

rainfall total - mm



The floods occasioned by Domoina made the road system impassable at some 200 points, requiring extensive detours; much of the country was inaccessible by road. Hundreds of other locations, especially on gravel and earth roads, necessitated immediate remedial attention and rehabilitation in the long-term, as road wearing courses were washed out.

Representatives of the United Nations Development Programme (UNDP) and the USAID Mission, in cooperation with relevant ministries of the Government of Swaziland (GOS), compiled an assessment of damages. Their report, summarized below, shows that the area of public infrastructure was more seriously impacted than any other.

ESTIMATE OF DAMAGE CAUSED BY CYCLONE DOMOINA
(in US dollars)

Type of Damage	Damage Estimate
Roads and Bridges	$ 33,225,000
Railways	10,200,000
Small-Scale Irrigation	1,380,000
Dams and Gauging Stations	1,360,000
Power Installations	720,000
Citrus/Pineapple Infrastructure (Private)	690,000
Crop Losses(Private)	550,000
Rural Water Systems	230,000
Education Facilities	230,000
Agricultural Structures	120,000
Communications	110,000
Urban Water and Sewerage Systems	95,000
Health Facilities	90,000
Total Estimated Damage	$49,000,000

(Source: UNDP 6 weeks after cyclone)

Immediately after the cyclone abated, the Ministry of Works and Communications (MWC), in collaboration with the Ministry of Natural Resources, Land Utilization and Energy (MNRLUE) and the Ministry of Agriculture and Cooperatives (MOAC), commenced an emergency program to clear roads and effect short-term emergency repairs; private commercial farmers assisted in this endeavor with heavy equipment. This action opened virtually all areas to road transport, although detours on secondary, gravel roads were often necessary. Many bridges were repaired, or rivers were crossed by fording or by the installation of Bailey bridges.

As the immediate task was to reinstate road links, repairs were of an emergency nature and were not to standard; this was simply a "holding operation". Some of the repairs, involving plugging of dangerous spots, have already failed because of the unusually heavy winter rains. As structures and pavements have already been weakened, a proper rehabilitation program to standard must be commenced immediately, before more roadway is exposed to failure and erosion during the heavy rains ahead. A British aid engineering expert has indicated that unless a rehabilitation program is embarked upon shortly, the nation stands to lose major segments of its road infrastructure worth in excess of $250 million at replacement costs.

During the first month, as the Government was pushing forward with its emergency program, thousands of dollars in cash and in kind were contributed from around the world. Initial relief contributions to the GOS included:

United Kingdom	$500,000	Bailey bridges; engineers
United States	$385,000	clinic, irrigation repairs
Italy	$120,000	medicines
UN Agencies	$100,000	cash; medicines; specialists
Belgium	$ 55,000	cash
Australia	$ 38,000	cash
West Germany	$ 36,000	cash
Oral Roberts University	$ 36,000	medicines
Republic of China	$ 50,000	cash

In addition, the Republic of South Africa provided assistance immediately following the cyclone and additionally provided commercial credits for railway repairs, two helicopters for relief work, tents, and blankets; Israel provided emergency medical supplies. Contributions were also received by non-government Swazi relief organizations from the following sources:

Canada	$ 95,000
Denmark	$ 82,000
Netherlands	$ 64,000
Norway	$ 62,000
E.E.C.	$ 58,000
United States	$ 25,000
Swiss Red Cross	$ 20,000
Lutheran Federation	$ 30,000

By April, the MWC had projected the costs of both temporary repairs and permanent solutions to the disaster damage. Discrete projects totaling some $37,155,000 were identified and transmitted to the international donor community for its consideration. The table on page 11 shows the individual projects and the estimated costs of each as currently estimated by MWC. This table differs in total slightly from the UNDP table presented earlier (p. 9). This was because of later more accurate assessments of repair costs.

ESTIMATED COSTS FOR RECONSTRUCTION OF BRIDGES AND ROADS

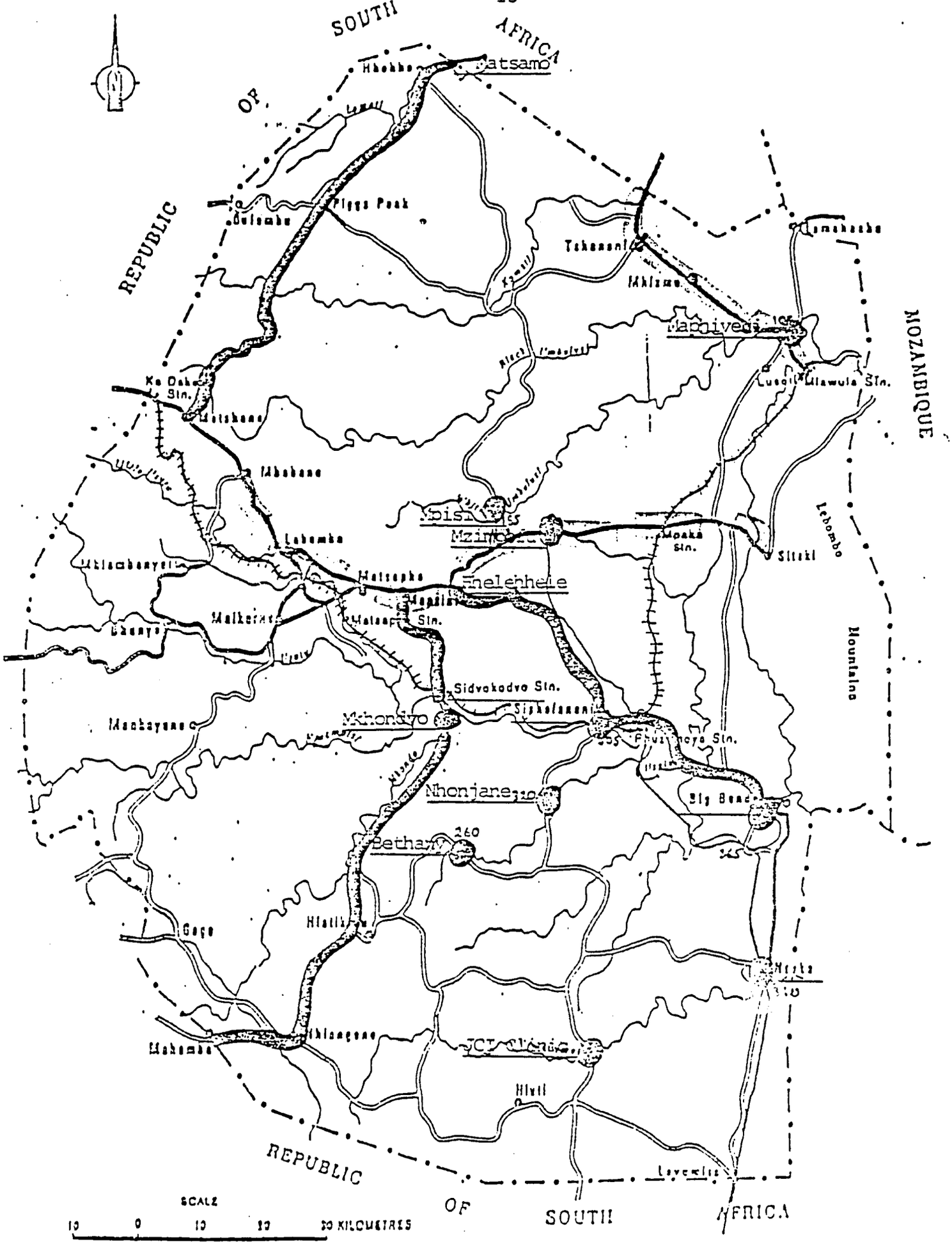
Location	Temporary Repairs	Permanent Solution
A. Bridges:		
Big Bend	$190,000	$ 3,500,000
Nsoko	240,000	1,400,000
Siphofaneni	-	350,000
Maphiveni	110,000	3,500,000
JCI Clinic	140,000	-
Mpisi	60,000	210,000
Nkonjane	40,000	2,100,000
Bethany	-	280,000
Sidvokodvo	-	110,000
Mkhondvo	-	85,000
Mzimpofu		85,000
Sub-Total, Bridges	$780,000	$11,620,000
B. Surfaced Roads:		
Mkhondvo-Mahamba	$350,000	$ 3,500,000
Mknondvo-Manzini		700,000
Motjane-Matsano		420,000
Hhelehhele-Big Bend		2,800,000
Drainage System Rehab		1,800,000
Sub-Total, Surfaced Roads	$350,000	$ 9,220,000
C. Gravel/Earth Roads (and Associated Bridges)		
Mbabane District	(190 miles by Contracts)	$ 2,200,000
Siteki District	(190 miles by Contracts)	$ 2,200,000
Nhlangano District	(190 miles by Contracts)	$ 2,200,000
Lubuli District	(190 miles by Contracts)	$ 2,200,000
Sub-total, Gravel/Earth Roads (by Contracts)		$ 8,800,000
D. Rural Footbridges		$ 140,000
E. Roads Branch Capacity Enhancement		$ 1,060,000
Gravel/Earth Roads (500 miles) by Roads Branch Units		$ 4,000,000
F. Contingencies and other Unidentified Bridge Repair and Reconstruction		$ 1,865,000
Total Bridge and Road Reconstruction		
- Temporary Repairs	$ 1,130,000	
- Permanent Solutions	$36,025,000	
Total		$37,155,000

Source: Ministry of Works and Communications

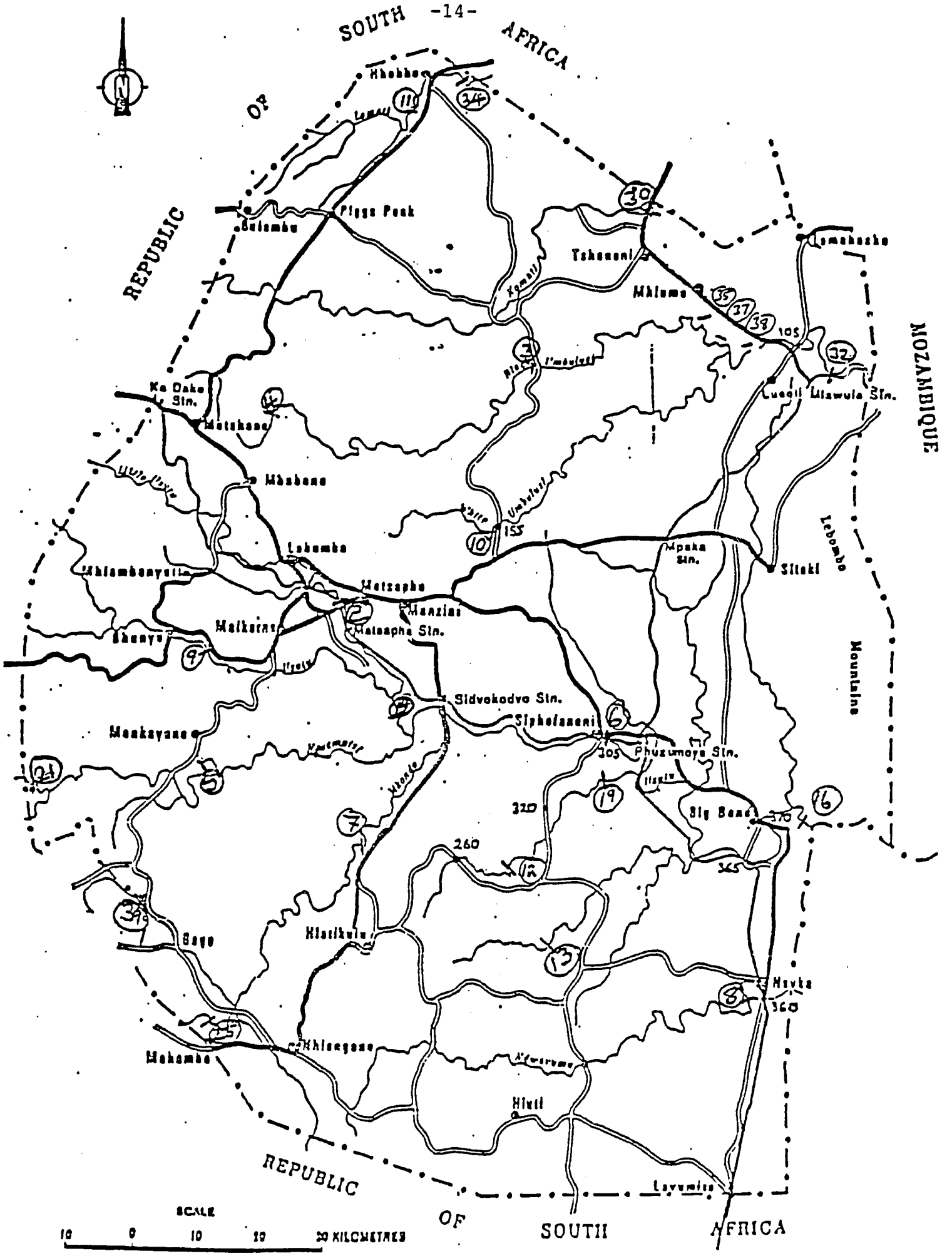
Locations of bridges and surfaced roads to be reconstructed are found on the map on page 13. In addition, the Roads Branch itself will rehabilitate about 500 miles of gravel and earth roads in rural areas (approximately 100 in Mbabane Road District, 120 in Siteki Road District, 160 in Nhlangano Road District, and 120 in Lubuli Road District). Locations of unpaved roads, by priority level, are included in Annex L.

The restoration of stream gauging stations throughout Swaziland is also important to further agricultural progress. Of the 42 stations in operation since 1953, 33 were heavily damaged by the cyclone. Specifically, 21 weirs need repair or reconstruction; 19 instrument towers require replacement or repair; 18 strip-chart recorders are to be replaced or repaired; and 3 telemetry stations must be replaced. With some 80 percent of its monitoring stations out of operation, the Water Resources Branch is unable to assess, allocate, or conserve adequately the surface water resources of the country. The restoration of the gauging systems is needed to maximize the use of scarce water resources (especially for agricultural development), to provide early flood warning, to permit basin management and water exploitation planning, and to secure for Swaziland its fair allocation of water through closely-monitored international agreements. This reconstruction effort is estimated to cost $329,000 over three years.

(See page 14 for a map detailing the locations of damaged stations.)



MAP 2. LOCATION OF BRIDGES AND PAVED ROADS TO BE REHABILITATED.



LOCATION OF WATER RESOURCES BRANCH GAUGING STATIONS

B. Rationale for the Project

The reconstruction of roads and related bridges is the highest developmental priority of the Government of Swaziland. The GOS is currently negotiating with the United Kingdom (for the Big Bend bridge), the African Development Bank (for the Mkhondvo-Mahamba road), and the World Bank (for $20 million to finance discrete road or bridge projects). A levy was imposed on all Swazi citizens and non-Swazi residents to help finance rehabilitation efforts. As a result of the cyclone damages, the GOS Roads Branch budget was increased by $800,000 to assist in rehabilitation work. An additional $1 million will be diverted to road rehabilitation from other Ministries or from cancellation of other road construction, maintenance, and improvement (hard-topping) programs. A related priority has been the reestablishment of river gauging stations, so as to allow the the Water Resources Branch of the MNRLUE to monitor and manage the water resources of the country and provide early flood warning protection.

Experience during the emergency period immediately following the disaster showed the need for experienced engineering staff and an effective equipment maintenance program. There are no experienced engineers within the Roads Branch; the three Swazi engineers in the Branch are newly graduated with bachelor of science degrees in civil engineering from Ohio State University. Emergency repairs immediately after the cyclone were effected with the assistance of three AID-financed engineers working with the Land Use Planning Section of the Ministry of Natural Resources, Land Utilization and Energy. Likewise, rehabilitation efforts were retarded because equipment was not working; in some cases, only one-third of the MWC equipment was operating, necessitating the loan of AID-financed equipment from the MOAC.

Under GOS rules, the Roads Branch is not responsible for maintaining its own equipment. Responsibility for procurement and maintenance of all government plant and equipment is assigned to the Central Transport Administration (CTA), a specially funded government organization.

The primary focus of the project is on the reconstruction of rural gravel and earth roads, through a strengthening of the institutional capacities at the Roads Branch and the use of its own staff. While paved roads and sixty percent of earth and gravel roads will generally be contracted out, the Roads Branch's rehabilitation units will concentrate on restoring some 500 miles of rural gravel and earth roads to pre-cyclone condition. Dislocations to the national economy must be remedied and free flow of goods and people within the country must be restored if development programs are to proceed.

The rehabilitation of disaster-caused damages is in keeping with AID's policy to assist those disadvantaged and afflicted by natural calamities. This proposal is also fully consistent with and supportive of the USAID/Swaziland Country Development Strategy. The Mission has emphasized the necessity of fostering the development of commercial agriculture on Swazi Nation Land. The cyclone, by damaging many of the rural roads, has significantly reduced the ability of the marketing channels to provide agricultural inputs and to transport crops to market in a timely fashion. The reduced quality of the roads has increased the farm vehicle operating costs and lowered farm profitability.

The Country Development Strategy Statement (CDSS) has maintained that irrigation offers one of the best opportunities for commercializing Swazi agriculture and rendering it more profitable. Without the river gauging stations, Water Resources Branch officials cannot measure the quantity of water available for apportionment and will not be able to discharge its water management responsibilities to commercial agricultural firms, and neighboring countries (with which Swaziland has treaty obligations). In the absence of usable and relatively accurate water flow information, the Water Resources Branch is hesitant to allow extension of irrigation schemes, as these may impact directly on contractual or treaty obligations.

USAID/Swaziland has been exploring with the GOS the possibility of contracting (with private firms) to complete some government activities. Our efforts are supported by an intermediate report of a German consultant group which suggests that certain operations, relating to major overhaul of equipment, should be contracted out by CTA. This project is in consonance with that suggestion, as it provides funds for contracting out maintenance and repair of road plant and equipment; it will develop and install a mechanism to contract out those tasks which are more effectively and efficiently undertaken by the private sector.

Finally, the CDSS has recognized the need for reinforcing undergraduate and graduate level education by on-the-job training and in-country technical, hands-on experience. Three engineers in the Roads Branch are recent AID-financed graduates; in order to be fully effective as supervisory construction engineers and managers, they must work side-by-side with experienced counterparts. This project will continue the enhancement of an institutional capacity in engineering (a process which started with AID-training in the U.S.) by providing the on-the-job experiences needed to complement and complete their education and enhance their managerial capacities. This will encourage an improved supervisory engineering capacity within the Roads Branch.

C. Project Objectives: Interrelationship of Goal, Purpose, and Output

The goal of this rural reconstruction project is to restore Swaziland's rural transportation infrastructure and stream flow measurement facilities to the conditions that existed prior to the disaster caused by Cyclone Domoina. This overall goal presupposes that the GOS has the financial and human resources (including management) to undertake general rehabilitation efforts in all sectors and that foreign donors, as well as commercial and concessional lenders, will make available financial resources currently beyond the means of the GOS. In light of international concern after the disaster, the early indications of fiscal commitments (by the United Kingdom, African Development Bank and World Bank), and the GOS's relatively light debt burden responsibilities, the assumptions can be realistically achieved.

The purpose of AID's support, in cooperation with the United Kingdom, is to assist the GOS in improving its capacity to repair and maintain roads damaged by Cyclone Domoina; the rehabilitation of the roads network to pre-cyclone conditions is the single most important element in the nation's return to normalcy. The project focuses on the rehabilitation of damaged gravel or earth roads undertaken directly by work crews of the Roads Branch. The British participation will assist design, contracting, and construction supervision of both gravel and paved roads and major bridge infrastructure destroyed by Domoina. A second component will promote the reestablishment of the Government's capacity to monitor and allocate water resources.

The end of project status (at the conclusion of two years) will see the rehabilitation of at least 440 miles of gravel and earth roads to previous standards. The project will also improve the engineering skills and supervisory abilities exhibited

by the three Swazi engineers. Due to the new maintenance program, (including a contracting out component), major repairs to plant and equipment will take a shorter time than prior to the project and will yield an average plant and equipment operational availability level of seventy-five percent. Finally, the project will culminate in the restoration (to a sufficient level of accuracy) of those thirty-three gauging stations damaged by Domoina, permitting the collecting and reporting of usable information needed to allocate water resources internally and comply with international requirements. Site visits, engineering reports, road counts, and water level readings will constitute the means of verification.

The assumptions necessary to achieve the project purpose for the Water Resources Branch of MNRLUE are that the GOS makes budgetary resources available in the second year of the project which equal or surpass its first year funding, and that the Swazi hydrologists will remain in the employ of the GOS.

The outputs will depend on the training of three Swazi engineers to be better able to design, manage, and supervise road repair and maintenance, and in the creation of a system whereby the Roads Branch can handle reconstruction of cyclone-damaged roads. The project output will lead to an enhanced institutional capacity framework within which human resources can be mobilized to rehabilitate gravel and earth roads. In addition, the project will pioneer an innovative means to repair and overhaul plant and equipment, via contract with the private sector, such that equipment assigned to the rehabilitation units will be operational at least seventy-five percent of the time. The water resources component will have as its output the operation of those stations damaged by the cyclone, such that water flow data are appropriately collected and of sufficient accuracy to use in the management of the nation's water resources.

The verification of Swazi counterpart improvement will be found in personnel evaluations by the two AID-funded engineers and by the senior roads engineer. From the vehicles maintenance point of view, the indicators will be a timely contracting system, in which work orders are issued for overhauls and major maintenance and equipment deadlining is cut to half of the pre-project level. The output of the water resources component can be verified by the existence of water flow data, which was interrupted by flood damage, and the extent to which it is analyzed to provide a meaningful input into the national network.

In order to achieve these levels of outputs, cooperation and close communication is necessary between CTA and the Roads Branch to ensure timely issuance of work orders or requisitions, and timely payments to contractors for services rendered. USAID's conversations with equipment dealers indicate that the CTA controller enjoys an excellent reputation for making timely payments. The new system within the Roads Branch will rely on the quick adaptability of work crews to the new tasks of rehabilitation, rather than mere regraveling (as is their current job). A major assumption for water resources project success is that contracts can be let to the private sector for the replacement of weirs.

D. Project Elements

1. General Description

This project has two discrete, capacity-enhancing components: road rehabilitation and water gauging station restoration. AID financing will total $1.25 million, with roads related funds totaling $1,065,000, and water resources $185,000. In the roads portion, AID will be joined by both the GOS (not less the $2.7 million for the salaries of counterparts and estimated plant and equipment contract maintenance expenses) and the British Overseas Development Agency ($250,000 for three engineers). In the water gauging component, the GOS will provide financing (at least $144,000) for the repair of weirs and in-country transport costs related to the installation of AID-financed strip-charts, instrument-housing towers, and telemetry equipment.

The roads rehabilitation component has three distinct elements:

A. $500,000 to provide, for two years each, two long-term technicians (supervisory engineers), for managing roads work in the field and providing on-the-job training for three Swazi engineers; additionally the supervisory engineers will help with the on-the-job training of Swazi engineering technicians assigned to the respective units.

B. $500,000 to finance up to $200,000 in contracts to private-sector firms for immediate major repair and overhaul to plant and equipment (at project start) and to finance up to $300,000 in long-term (two-year) time-and-materials contracts for the repair, overhaul, and maintenance of such plant and equipment as are assigned to the project, during the life of the project.

C. $65,000 to provide technical consultancies for site-specific rehabilitation engineering problems and for assessment of maintenance contracting and practical training efforts.

To initially complement the equipment repair and overhaul element, the Project Development and Support Grant will contribute $55,000 for an equipment overhaul specialist, who will prepare bid documents for the two types of contracts indicated above, and for equipment diagnostics by local representatives of deadlined plant and equipment maintenance.

The river gauging station component consists of four elements:

A. $56,000 for the repair or replacement of eighteen strip-chart recorders to continually monitor water levels;

B. $17,000 for the replacement of three telemetry devices to relay information of the flow data of selected stations to a central microcomputer;

C. $100,000 for repair or replacement of nineteen towers which house such recording and telemetric devices; and

D. $12,000 for short-term engineering consultancy work needed to assess weir damage, recommend preliminary design modifications, and prepare bid documents for the reconstruction of selected weirs by providing contractors.

2. Details of Roads Rehabilitation Component

The project proceeds from the conclusions that (A) the GOS has reasonably adequate human, capital equipment, and budgetary resources, and (B) these resources, as they relate to gravel and earth roads rehabilitation, are constrained by inexperienced engineering staff and inoperative equipment (as verified by initial relief efforts). Consequently, the Roads Branch, AID, and British ODA cooperated in designing a project which, from the human resources perspective, would provide for management of the roads reconstruction effort, for substantial on-the-job, practical training for Swazi engineers and engineering technicians (quality control inspectors), and for supervision of both in-house and contracted reconstruction of gravel and earth roads. To remedy the key problems with plant and equipment, AID, the Roads Branch and CTA collaborated in establishing an overhaul, repair and maintenance program, merging the strength of Roads Branch

drivers' handling/inspections procedures, the CTA field mechanics' preventive maintenance and minor (on-site) repair abilities, and the private sector's capabilities to undertake major repairs and overhauls in a timely and effective fashion and provide expendable supplies and spare parts, if not readily available from CTA.

Currently, the Roads Branch has five engineering positions: senior roads engineer and engineers for road maintenance, construction, contracts, and planning and design. Three of these positions are now occupied by Swazis who are recent B.S. graduates, and who lack in relevant field experience. In addition, the World Bank has recently completed a two-year training course at the Swaziland College of Technology for seventeen (17) engineering technicians, who will serve in a support capacity in the Roads Branch. This existing mix of human resources has determined the type of U.S. and U.K. assistance to increase the Road Branch's capacity to undertake the road rehabilitation effort.

First, the British will be supplying the Branch's senior roads engineer and another engineer for design and planning for a 30-month period. There is a high probability that another engineer will be assigned to monitor the Big Bend Bridge project and supervise other contract road and bridge work. AID will finance two supervisory engineers for two years, who will each have a Swazi assigned as a counterpart. The supervisory engineers will be in charge of the activities of the road rehabilitation units. There are four such units, in the aggregate containing seventeen work crews.

The two U.S. engineers will be supervisors and managers of the reconstruction program, will provide on-the-job training and experience to their Swazi counterparts, and will direct the work of the engineer technicians. The U.S. engineers will initially present (and revise every six months) a training program for their counterparts stipulating objectives, goals to be achieved, assignments given, and tasks to be done with diminishing amounts of direct supervision. In addition, the two supervisory engineers will be responsible for the equipment repair and maintenance program, including the co-authorization of work orders and requisitions under contracts and co-authorization of payment after repair work has been completed or parts delivered.

The Roads Branch has divided the country into four road maintenance districts, with a rehabilitation unit assigned to each district. These are constituted by redirecting the tasks of the current three regravelling units and one construction unit. Each of the supervisory engineers will manage the work in two districts. The priority for repair has already been developed by the Roads Branch using as criteria the average daily traffic on the road, the importance of the site to the integrity of the road system, site characteristics, and minimization of the time required to move heavy equipment from one location to another. It is expected that each rehabilitation unit will be able to restore (to pre-cyclone conditions) about 60 miles of gravel and earth road per year. The locations of such gravel and earth roads to be undertaken by the Roads Branch is shown by priority; the criteria for and calculations relating to such priority testing are presented in Annex L.

The U.S. engineers, working with the three Swazi engineers, will be responsible for the design of the roads, culverts, and small bridges in conformity with Roads Branch standards. In addition, they will supervise and monitor the construction operation for compliance with Roads Branch standards. In this regard, use will be made of the engineer technicians.

Although the GOS had originally requested AID to procure equipment for the project, a detailed analysis revealed that sufficient plant and equipment exists within the government (in either the Roads Branch, the MWC, or the Land Development Section of MOAC) to successfully undertake the project. Of the sixty-eight (68) pieces of equipment needed for the four rehabilitation units, only eight (8) are not currently within the control of the reconstruction groups. The Ministry will undertake to have this equipment transferred from other sections of MWC or from the Land Development Section. In some cases it may be more economical to hire the pieces, as they are needed infrequently for specialized operations. The GOS may decide to purchase some of the equipment.

The Roads Branch is charged with the construction, repair, and maintenance of the nation's relatively comprehensive road system, but it does not control a major element in the program: the procurement, maintenance, repair, and overhaul of its plant and equipment. These are the sole prerogatives of the CTA; indeed, although allocations for vehicle maintenance do appear within the budget of the Roads Branch, it can only be expended as a "service transfer" to CTA, as an equipment fuel charge which includes maintenance/depreciation or as a daily plant rental fee. As a

result, the second element of the project, the contracting of plant and equipment repairs, necessarily assists CTA, as well as Roads Branch. It proceeds from the conclusion that the CTA field mechanic staff (assigned to mobile units and district depots created especially to interact with the Roads Branch) can competently undertake preventive maintenance and minor (on-site) repairs, but that workshop repairs and overhauls or procurement of some spares takes an inordinate period of time in CTA. A German Consultants' report, financed by the German Agency for Technical Cooperation, found that on April 30, 1984, thirty (30) percent of all government vehicles were deadlined, more than fifty-five (55) percent of which had been inoperative for more than three months. According to MWC, as of June 1, 1984, thirty-eight (38) of the sixty-eight (68) pieces of plant and equipment to be used by the rehabilitation units were awaiting repairs at CTA.

To remedy this situation, CTA and Roads Branch have agreed to a special maintenance program for the project. Under the supervision of the AID-financed engineers, Roads Branch will vigorously enforce its first echelon of maintenance: daily vehicle visual inspection by drivers to prevent or minimize breakdowns (i.e. checking oil, pressure, water level, lubrication joints, etc.). Furthermore, CTA has agreed to provide mechanics to staff mobile maintenance trucks assigned to each rehabilitation unit. These mobile units, under the direction of the two supervisory engineers, will provide second echelon maintenance (of a preventive nature) on a regularly-scheduled basis and handle minor repairs. To ensure that procurement of expendable supplies and spares (air or oil filters, batteries, etc.) for the mobile units does not become a problem, the supervisory engineer, upon co-signature of the Senior Mechanical Engineer of CTA, will procure such items directly from the maintenance service contract (cited below). Such requisition will be issued only if a needed item is not currently available in CTA stocks and is not likely to be available within five work days.

The third and fourth echelons of maintenance - repairs or overhaul requiring the physical removal of plant/equipment from the work site - will be contracted out to private firms. As the result of open, advertised competitive procedures, maintenance contracts (of a time-and-material nature) will be signed with a firm (or firms), stipulating part prices, labor costs per hour, and general amount of time required in certain selected repair/overhaul jobs.

Work orders will be issued against such contracts, if the mobile unit mechanics cannot undertake the repairs. Requisitions for parts/expendables will be placed under the

contract, if such are not effectively available to on-site CTA mechanics. The supervisory engineer and the Senior Mechanical Engineer of CTA must both sign the work order or requisition. The contractor will repair the equipment within the contract-stipulated time (or replace the defective part, while the original one is being overhauled). Performance bonding, (meaningful) liquidated damages for delays, and work/part warranties for a year will be among the terms and conditions of the contract.

Payments to the contractor shall be made within thirty (30) days, but only after invoices have been certified by the supervisory engineer (as to the acceptability of services/parts rendered) and signed by the General Transport Manager of CTA. CTA will maintain separate sub-ledgers to account for all funds disbursed under the contracts to ensure accountability. When a contract is signed, a maximum obligated amount will be assigned to it (corresponding to the maximum projected work as estimated by a contractor equipment specialist,) and such will be reserved administratively within CTA's general contracting line-item.

In advance of the project, AID will use Project Development and Support funds to finance a contractor equipment specialist who will draft the bid documents for these long-term (for one year, with second year option by the GOS) maintenance and repair time-and-materials contracts. The specialist will also draft bid documents, drawing on information contained in equipment diagnostic testing/inspections reports (to be prepared by local representatives of manufacturers), for the immediate repair or overhaul of plant and equipment currently deadlined. The specialist will also assist in the evaluation of bids and with drafting of both series of contracts; as indicated above, the specialist will also assign the maximum foreseeable amount of work for each contract (for purposes of administration reservation). The specialist will review and comment on the Roads Branch's vehicle inspection program to minimize the need for calling on the time-and-materials contracting procedures.

The last element of the road rehabilitation component is the provision of short-term technical consultation on site-specific engineering problems and on the mechanisms (and improvements thereon) of the maintenance contracts. Approximately five person-months is anticipated, some of which will be needed during project review and evaluation at various points during the life of the project. As the engineering problems (which originated from a cyclone disaster) are of such an unusual array this flexibility must be provided to supplement the supervisory engineers experience during rehabilitation.

3. Details of Water Gauging Station Component

Initially, the Water Gauging station component will fund, under GOS standard terms, the salary and travel (estimated at $12,000) of a short-term consultant who has previously worked with the Water Resources Branch in the construction of weirs. The consultant (from a Swazi-registered firm) will assess weir damage, estimate repair costs, and suggest preliminary reconstruction design. Four weirs must be replaced, while another seventeen can be repaired. He will prepare bid documents for private contracting of some of the weir replacement work.

Instrument housing towers, recorders, and telemetry equipment will be procured and installed on a phased basis over a two year period. The first phase will include repair of three gauging stations in the Mbuluzi Basin, to measure compliance with an existing agreement between Mozambique and Swaziland. The second phase will include repair of stations which are critical to the apportionment of water to more than 30,000 irrigated acres in the Usutu Basin near Siphofaneni and in the lower Ngwavuma Basin. The third phase will include the repair of stations along Swaziland's borders, while the fourth phase will include repair of stations at hydrologically significant points at other locations in the country's interior.

Instrument housing towers will be procured locally; Swazi firms have the capabilities to fabricate such towers. The contract for these will be bid by the Water Resources Branch under GOS procedures; AID will directly pay the manufacturer upon receipt of GOS signed vouchers and invoices. Water Resources Branch will install the towers from its own account.

Strip-chart recorders will be procured from the United States from the source that has been providing such recorders to the GOS for its river gauging stations in the past. It will be necessary to continue this procurement from the sole source to preserve uniformity within the nation's water measuring system, to allow collection of accurate and comparable information, and to permit standardization in parts and servicing. Such strip-chart recorders will be procured by AID-issued PIO/C's and will be installed in towers by the Water Resources Branch; in-country transportation and installations of recorders will be for the account of the GOS.

Telemetry equipment for three sites will be procured by the project from the source (in South Africa) which is currently contracted to supply the equipment. As this is replacement equipment and a current contractual obligation exists with the firm, procurement will be under the existing contract on a sole source basis. Although such contract was conceived (before the disaster) as a means to expand the telemetry coverage of stations, it can be used as a vehicle to procure replacement telemetry equipment destroyed by Cyclone Domoina. To permit expedited installation, equipment previously designated for an expansion of the Water Resources program will be diverted to replace destroyed telemetry equipment; AID will then replace the telemetry equipment.

In light of the urgency to restore the integrity of the gauging stations in order to apportion water to in-country right-holders and to comply with treaty obligations with Mozambique, the Water Resources Branch has already undertaken some obligations, by diverting funds within its budget, in the anticipation of receiving supplemental funds from the GOS and foreign donors. It is the intent of this project for AID to reimburse expenditures made for weirs-related technical assistance, towers, recorders, and telemetry equipment, based on commitments made after January 31, 1984 and arising as a direct result of the Domoina disaster of that date, even though such obligation occurs prior to the date of grant signature. An integral part of the project will be GOS-financing of the replacement or repair of weirs. This is work which must be done mainly in the dry season. Although experience in years past has shown private contracting out to be three or four times more expensive than GOS in-house construction, the Water Resources Branch will bid specific priority replacement projects to identify clearly the difference in cost in today's terms. The urgency of restoring the gauging system and the fact that the GOS can only rehabilitate six weirs a year may force it to contract out, if costs are not excessive. These costs will be borne by the GOS.

Initially, the AID-financed equipment will be used to record the flow through damaged weirs, providing data which is less accurate than obtained from an undamaged weir, but temporarily adequate for allocation of water. The AID-financed equipment will be installed in the AID-financed towers, and will not be jeopardized by the condition of the weirs.

4. Project Beneficiaries

The roads rehabilitation component will directly benefit the institutional structures of the Roads Branch and, marginally, CTA. Beneficiaries will include the three Swazi engineers and the supervisory structure of the Roads Branch; additional beneficiaries will be the engineer technicians and the enhanced quality control capabilities they will bring to work crews. Secondarily, the maintenance contracting will demonstrate the advantages of contracting out.

Ultimately, the beneficiaries of the road rehabilitation component of this project are the residents of rural Swaziland. Specifically, farmers who depend on these roads to receive inputs and sell their production (as well as those small agricultural commercial businessmen who need roads to sell inputs) will be prime beneficiaries. In a more profound sense, the rehabilitation effort will favorably impact on all of society to restore national life to the conditions before Cyclone Domoina, facilitating the flow of goods, services, and people and allowing freer access to rural centers of commerce and such social infrastructure as clinics, schools, and government offices.

The water resources component will directly benefit those who rely on the surface water for their activities. It will directly assist commercial irrigated agriculture in Swaziland, and hydro-electric power stations. More importantly, it will assist small-scale irrigated farmers, with permits to divert water, particularly those with permits to divert water only when flows are above a pre-determined level (surplus flow diversion permits). In a global sense, the national interests of Swaziland will benefit in water use negotiations with South Africa.

III. COST ESTIMATE AND FINANCIAL PLAN

Including a 6 percent inflation on all U.S. costs and a 14 percent inflation on Swaziland costs, plus using an exchange rate of $1.00=E1.62, the total cost of this project is $4.36million, with $1.25million (28.7 percent) provided by USAID and $2.86million (65.6 percent) contributed by the Government of Swaziland. The British Government is providing two engineers costing $250,000 (5.7 percent). For details see the financial tables which appear on the next page.

The project will be fully obligated in FY 1984 but expenditures will take place over the two year life of project.

Nearly half the USAID contribution is for technical assistance, and the balance is to purchase commodities. Eighty-five percent of the USAID contribution is for rural road reconstruction with 15 percent for rehabilitating river water gauging stations. The GOS contribution is 46 percent for personnel and 54 percent for commodities. Ninety-five percent of the GOS contribution is for the rural road reconstruction. All of the British contribution is for personnel on rural road reconstruction.

The Ministry of Works and Communications, the Ministry of Finance, the Central Transport Administration and the Department of Economic Planning and Statistics are aware of the required GOS financial contributions and have indicated that the required funds will be available this fiscal year. Further, the relevant portions of the GOS budget for the next two fiscal years will be funded to the levels required by the project.

Agreement has been reached with the Central Transport Administration as to how the USAID contribution to repairs and rehabilitation of Roads Branch equipment will be handled, and what financial records will have to be maintained.

Details on the assumptions behind the budget are contained in Annex I.

ILLUSTRATIVE BUDGETS

USAID

Rural Road Reconstruction	
Long Term Technical Assistance	500,000
Short Term Technical Assistance	65,000
Spare Parts and Maintenance	500,000
sub-total	1,065,000
River Gauging Stations	
Water Gauging Equipment	173,000
Short Term Technical Assistance	12,000
sub-total	185,000
TOTAL	1,250,000

GOVERNMENT OF SWAZILAND

Rural Road Construction	
Counterparts	25,000
Personnel	1,183,000
Equipment	1,446,000
Home/Furnishings	23,000
Vehicle petrol/maint.	15,000
Office Space	14,000
Office Support	8,000
sub-total	2,714,000
River Gauging Stations	
Weir Reconstruction	144,000
sub-total	144,000
TOTAL	2,858,000

COMBINED EXPENDITURES

	USAID		GOVT. OF SWAZILAND		U.K.	TOTAL
	FX	LC	FX	LC	FX	
Personnel	577,000	- -	- -	1,332,640	250,000	2,159,640
Commodities	379,750	293,250	747,200	778,160	- -	2,198,360
TOTAL	956,750	293,250	747,200	2,110,800	250,000	4,358,000
GRAND TOTAL	1,250,000		2,858,000		250,000	4,358,000
(percent total)	28.7%		65.6%		5.7%	100.0%

IV. IMPLEMENTATION PLAN

A. Road Rehabilitation Component

Prior to signature of a grant agreement, a PDS-financed equipment specialist will arrive in country and assess the condition of plant and equipment assigned to the Roads Branch, such that a bid document or documents may be prepared to overhaul and repair deadlined equipment. In consultation with CTA, Roads Branch, and the Tender Board, he will prepare bid documents and repair/overhaul specifications, will assist in the evaluation of formal bids, and will help draft and negotiate the final overhaul contracts. (More than one contract will be necessary, given the different makes of plant and equipment.) He will provide the same services for a longer-term repair and maintenance contract (based on time-and-material provided under work order or spares provided under requisition). He will finally review the joint CTA-Roads Branch maintenance program, make recommendations thereon, and provide training for maintenance contract monitoring and administration.

The consultancy will last up to ten weeks; during which time he will collaborate with a West German consulting firm evaluating CTA and at least one of the U.S.-financed supervisory engineers provided under this project. He will also return one year into the project to assist in the evaluation of maintenance contractory procedures, to provide further training in contract administration, and to make recommendations relating to the renewal of such contacts. This second consultancy for one month will be procured under a contract using project funds.

The two American supervisory engineers will be hired by the Roads Branch as GOS employees. As non-GOS-funded operational experts, the engineers will be recruited by TransCentury Corporation under a contractual agreement which USAID/Swaziland already has in effect. One engineer has already been identified and will be on-site by October 1, 1984; a second engineer will arrive as soon thereafter as possible. Under these arrangements, the engineers will receive housing support, housing maintenance, office space, and an office vehicle by the MWC. (It is anticipated that the UK's ODA will be providing the Roads Branch's senior roads engineer by October 1, with another British engineer arriving December 1, 1984).

The roads component will be implemented primarily through the Roads Branch of the Ministry of Works and Communications. Special modified arrangements have been negotiated with the Central Transport Administration (CTA) through which CTA (which has the responsibility to maintain Roads Branch equipment) will contract out for major repairs, overhauls, and related parts. These arrangements will be under AID host country procurement regulations.

The two series of maintenance contracts (the first for immediate overhaul of deadlined plant and equipment and the second for their long-term maintenance and repair) will be signed by CTA. As a result of open, competitive bidding, it is anticipated that contracts will be signed with private sector Swazi or South African firms. In light of the performance bonding, service and parts guarantee and liquidated damages provision of the contracts, it is likely that the authorized agents of plant and equipment manufacturers will be awarded the contracts.

To ensure full funding, CTA will subobligate the total estimated contract cost for each such maintenance contract and track expenditures on a subsidiary ledger. Work orders and/or requisitions will be used to access these time-and-materials contracts; such must be co-signed by the U.S. supervisory engineer (Roads Branch) and the Senior Mechanical Engineer (CTA). Upon completion of the work and delivery of the equipment to the work site, the supervisory engineer will certify completion in compliance with contract terms.

Upon authorization to pay by the General Transport Manager, CTA will then process the transaction for payment under its open trust account. The payment vouchers will be paid by the Swazi Treasury and a pre-agreed portion of these disbursements will be passed periodically to AID for reimbursement from the project grant account. Subject to revision as the project proceeds, AID will expect to disburse the allocated portion of the grant in a sum of up to $200,000 for the initial repairs of the equipment, and the balance in amounts equal to $50,000 or up to one-half of the total expenditures made for each quarter, whichever is less.

The Roads Branch will administer the contracts and monitor compliance with their terms; CTA will establish separate accounts for each contract (to ensure AID auditability). It is anticipated that the immediate overhaul contracts will be signed by November 1 and the longer-term, time-and-materials contracts by November 15.

During the project, site-specific engineering problems may arise which require technical expertise not possessed by the U.S. supervisory engineers or others within the MWC. AID will procure by the contractor mechanism, if such individual is not available locally, a consultant or technical expert who would provide such expertise. If locally procured, the GOS will undertake the contracting under its own rules and regulations (including standard hourly rates and mileage charges). USAID/Swaziland will either make direct payment to the consultant or will reimburse the GOS for consultant-related costs, including salary, travel, per diem (if needed), overhead, and other direct costs.

B. Water Resources Component

The water gauging component of the project will be implemented through a designated officer of the Water Resources Branch (WRB) of the Ministry of Natural Resources, Land Utilization and Energy. Most of the work on two destroyed weirs and thirty one damaged weirs can only be accomplished during the dry season.

As regards technical services for weir damage assessment, reconstruction designing, and preparation of related construction bidding documents, AID will finance up to $12,000 of such services, consistent with a contractual arrangement negotiated between a Swazi technical firm and the WRB. A resident consulting firm of recognized expertise, Watermeyer Legge Piesold & Uhlmann was selected, based on WRB's prior experience with the firm, its ability to undertake the work immediately and provide local continuing follow-up support, and the firm's previous designs of weirs impacted by the flood. As a result of predominant capability and immediate availability, AID will reimburse the GOS for up to two person months of these services at standard GOS rates for such services (as negotiated last year by the MWC). As it is not of U.S. or Swazi nationality, a nationality waiver will be processed before reimbursement will be made.

The strip-chart recorders will be purchased from the current United States supplier. AID will procure the equipment directly through the PIO/C mechanism; a REDSO/ESA supply officer will prepare the PIO/C, based on specifications provided by the Water Resources Branch. A sole source waiver (based on standardization of the Branch's instrumentation compatibility with system-wide recorders, and effective service ability) has been prepared. Shipment of the recorders will be by air freight FOB Manzini, Swaziland.

Finally, three telemetry devices will be purchased under an existing WRB contract. As USAID will be replacing three devices diverted from an expansion program to the flood-damaged stations, AID will make payment to the contractor, only after the three devices destroyed by Domoina have been physically replaced and are operational. The REDSO/ESA supply office has prepared both a sole source and a source-origin waiver, which will cite current contractual obligations, service ability, and system-wide compatibility with an existent microprocessor (to which water level data is transmitted every twenty minutes by the telemetric equipment).

PLANNED IMPLEMENTATION AND FINANCING METHODS FOR THE AID ASSISTANCE

Project Element	Implementation Method	Financing Method
Roads Rehabilitation:		
- Long-Term Technical Assistance	OPEX, under existing Contract	Direct Reimbursement
- Short-Term Technical Assistance	Delivery Orders under existing Contract	Direct Reimbursement
- Repair/Maintenance Contracts	Host Country Contracts	Direct Reimbursement to GOS
Water Gauging Station Rehabilitation:		
- Equipment	PIO/Cs and Implementation Letters	Direct Payment to Suppliers
- Short-Term Technical Assistance	Implementation Letters	Direct Reimbursement to GOS

V. MONITORING PLAN

The supervisory engineers will design a work plan and the Roads Branch will immediately establish a Project Monitoring Committee for the project. The purpose of the Committee will be to verify progress against that work plan, to identify problems and to seek resolution of any impediments to progress. This Committee will consist of representatives from the Roads Branch, CTA, and USAID/S plus the two Supervising engineers. The Roads Branch representative will chair the meetings which will be called every six months. Progress meetings will be held monthly.

The Mission Agricultural Development Officer is the project manager and AID's officer primarily responsible for the project. An AID engineering officer and other special AID technical skills will be provided from REDSO/ESA or AID/Lesotho as required. An AID engineering officer will participate in the six month road planning meetings and the mid-term evaluation scheduled for mid 1985. The AID project manager will visit with the supervisory engineers in the field as often as possible.

The Water Resources monitoring component is similar to that of the Roads Branch. The Monitoring Committee will consist of Water Resources Branch officials, AID representatives and a representative from the local firm awarded the weir reconstruction contract. Progress meetings will be held each month to report on progress and to identify and resolve problems affecting progress.

The field work on the gauging stations will be affected by the level of flow in the rivers and by rain on the access roads. The AID project manager will schedule visits to the work sites as conditions permit during the course of the project.

VI. SUMMARY OF ANALYSES

A. Administrative Analysis

By its nature, this project seeks to restore road and water gauging systems to the conditions prior to Cyclone Domoina. Current administrative structures exist under which the original systems were constructed, maintained, and utilized. Thus, qualified individuals exist in established positions within the three governmental entities responsible for the implementation of this project. The project builds on these structures, altering functions and work responsibilities slightly, but still maintaining the same individuals which have coped admirably in the face of adversity.

B. Economic Analysis

Each of the components of the Rural Reconstruction project is economically viable on its own.

1. While the data is limited, and some of its accuracy is questionable, for a wide range of possible assumptions, the proposed expenditures on road rehabilitation are economically viable. The real internal rate of return for these roads will be in excess of 16%.

2. A better idea of the cost of doing the repair and maintenance of equipment will be known when the tender documents are returned from the bidders. Analysis of time and material repair manuals indicates that performing these functions by private sector contracts rather than by using the Central Transport Administration will be less costly to the Government of Swaziland and result in a larger proportion of the Roads Branch fleet being operational.

3. The last component of the project is the provision of river gauging stations. The availability of accurate river flow data will result in more accurate apportionment of water use rights. In Swaziland, the returns to small-holder irrigation are sufficiently high to make irrigation a viable alternative to urban migration given the current levels of unemployment. The information on river flows is necessary to meet international agreements and meet the demands for additional river apportionment rights for new irrigation schemes throughout Swaziland.

C. Environmental Analysis

The project will reconstruct sections of existing roads to their pre-cyclone condition. The patterns of traffic following these works will be those to which the people have been accustomed. No new cultural impacts are anticipated. Transport difficulties impaired since the January flood will be eased.

Actual site work will cause local disturbances with dust, noise, and clouding of streams with disturbed silt. The sites are fairly isolated from homesteads and animal life and these disturbances will be of minimal impact on the environment and ecology.

The AID inputs to this GOS effort will accelerate the schedule of works and shorten the period of disturbance. The environmental effects are foreseeable and minimal. Further environmental assessment is not necessary.

D. Financial Analysis

The Rural Reconstruction Project is not directly revenue producing. It will have an indirect impact on the government's earnings from taxes. From the standpoint of the beneficiaries it lowers their vehicle operating costs, and permits the expanded use of river water in irrigation. Both of these will have positive effects on the beneficiaries' net discretionary income. Analyzed differently, the GOS, by placing very high priority on infrastructure rehabilitation has demonstrated that it feels the economic health of the kingdom depends on the repair of the damage caused by the cyclone.

The current financial situation of the GOS is sufficiently good that there is little doubt that it will be able to meet its contractual obligations under this project. The CTA has an open trade account which allows it to pay as necessary to keep the government plant and equipment operational. It thus has the funds to meet its share of the project costs.

E. Social Soundness Analysis

The main social impact of the Rural Reconstruction project will be in the rural areas of Swaziland. The project does not introduce innovations but attempts to reconstruct farm to market feeder roads and water gauging stations to their pre-cyclone condition. The roads rehabilitation component will directly impact most on the Swazis who live in the rural areas and on those who commute and trade in the rural areas. The water gauging component will directly impact on the end users of river water, mainly small and large-scale irrigators.

Eighty-five percent of the Swazis live in the rural areas; most who live in the peri-urban areas maintain strong ties to rural homesteads. Damage to the road network has reduced the ability of rural Swazis living on the homesteads to freely pursue their economic and commercial activities, mainly agricultural. Also, urban based wage earners have been hampered in returning to help with homestead activities.

This project is totally compatible with the socio-cultural environment in Swaziland. It will in effect reconstruct important rural roads to their pre-cyclone condition and allow once more the unhindered movement of rural Swazis. The rural roads benefit all Swazis and are a major factor in rural development in Swaziland.

In addition, the project increases the ability of the GOS through the Water Resources Branch to allocate water for irrigation purposes. Although the major groups benefitting from the GOS' ability to apportion water resources are the large irrigated plantations, hundreds of current and future small-scale irrigation farmers will also benefit.

The project will benefit some groups more than others. For example, commercial farmers may benefit more than subsistence farmers because they use rural roads to sell their outputs and purchase needed inputs. However, the project will not adversely affect any certain group. Since most Swazis in both the rural and urban areas extensively utilize the road network, including the poorest Swazis on inexpensive buses, all Swazis will benefit from the reconstructed rural roads system. Annex H includes a detailed description of project beneficiaries.

F. Technical Analysis

The roads network of Swaziland (1,700 miles) is composed of 22% asphalt surfaced, 54% gravel surfaced, and 24% unimproved dirt surfaced. The flood of January 1984 caused considerable erosion in the highveld of northern and western Swaziland of embankments, drainage ditches, and of gravel and dirt surfaces. In the lowveld of southern and eastern Swaziland, culverts and bridges were blocked with silt and debris from this erosion, stream channels were de-stabilized, and nearly every bridge suffered damage or loss.

The Roads Branch plans to divert and direct the three regraveling units and the construction unit to reconstruction work, while leaving normal maintenance to the other equipment units as normally scheduled. This approach will permit the GOS to maximize the participation of its own forces while of necessity put various other more major reconstruction works out for contract.

The desired composition of these four field work units has been assessed and the GOS is proceeding to secure an additional two vibrating rollers, three concrete mixers, one flatbed truck, one excavator, and one lowboy truck/trailer. As required, equipment may also be hired on a short term basis to meet priority field needs and keep the group operating.

In order to restore down equipment quickly to operating condition, and to enable rapid repairs during operation, an equipment specialist is being brought in under a direct AID contract, for up to ten weeks, to assess needs, sources, and costs of initial repairs and to assist the GOS to establish contracts for supply of repair services and parts during the course of the project.

Two roads engineers will be contracted for a two year period to assist Roads Branch by planning, designing, and supervising the work of the four field groups devoted to reconstruction. These engineers will verify already on-going progress on the reconstruction work and plan the disposition of each group of equipment and fully direct its activities. They will develop a control system that will keep them fully advised of the status of equipment, personnel, support materials, and of repairs and parts.

The two supervising engineers will be primarily responsible for ensuring the efficient operation of the four field groups. As time permits, they will also be available for consultation to Roads Branch officers responsible for the regular road maintenance program.

Thirty-three gauging stations on five rivers were damaged by the flood, including various weirs, supporting towers for recorders, recorders themselves, and telemetry. This network of stations is the responsibility of the Water Resources Branch of the Ministry of Natural Resources who have carefully assessed the damage at each site. The GOS will undertake the restoration of twenty-one weirs.

AID inputs will occur up front with procurement of 19 replacement towers, 18 recorders, and 3 telemetry units. In addition AID will also fund the services of a consulting civil engineer firm resident in Swaziland to assist the Water Resources Branch engineer in assessing and scheduling remedial work to be done on the weirs and to prepare bidding documents. These engineering services are required immediately and are expected to be underway before the signature of an AID agreement with the GOS on this project in order to complete these assessments and initiate repairs before the rainy season.

VII. CONDITIONS AND COVENANTS

The two non-standard conditions precedent to initial disbursement for the project relate to the positions of the U.S. supervisory engineers within the Swazi governmental structures and the assignment of sufficient plant and equipment to the rehabilitation units to maximize their effectiveness. As AID will recruit the two U.S. supervisors under OPEX procedures the GOS must enter into work agreements establishing the responsibilities and authority of the engineers. Such positions are project-related, and expire upon project completion. They require no GOS salary. A second condition precedent will require evidence that the government has transferred, procured, made arrangements to lease, or has otherwise made available the eight additional pieces of plant and equipment deemed necessary to the effective operation of the rehabilitation units.

The government will maintain its present level of financial support for the rehabilitation progress and will promptly pay maintenance contractors. Specifically, the Government will covenant to present to Parliament a budget for the Ministry of Works and Communications which will finance district rehabilitation unit activities for the fiscal year starting April 1, 1985 at a level not less than that actually spent in the 1984/85 fiscal year. A second covenant will commit the Government, though CTA, to make prompt disbursements to maintenance service contractors provided that such work or supplies which have been provided is certified as accepted and satisfactory by the Roads Branch supervisory engineer and is authorized for payment by the CTA General Transport Manager.

As regards the water resources component, a covenant will ensure that the Ministry of Natural Resources, Land Utilization and Energy will present to Parliament for the fiscal year starting April 1, 1985 a budget which is at least equal to the amount spent in the 1984/85 fiscal year by the Water Resources Branch for the repair and reconstruction of the weirs.

VIII. EVALUATION ARRANGEMENTS

It is important that as early as possible in the project a review be made of:

(a) the experience with on-the-job training of Swazi engineers and engineering technicians;

(b) the contracting mechanisms for vehicle maintenance/repair work; and,

(c) the progress on repairing water gauging stations and installing AID-financed equipment.

The first review will occur six (6) months into project implementation. This is early enough to make corrections and revisions to problems affecting the institution building, contracting, and hydrological data accuracy aspects of the project. Reviews will include the Agricultural Development Officer (USAID/Swaziland) as Project Officer, the Regional Economist (USAID/Swaziland), the Regional Engineer (USAID/Lesotho), the Project Development Officer (USAID/ Swaziland), the two U.S. supervisory engineers, the Senior Roads Engineer (British), Chief Professional Officer (Ministry of Works and Communication), the Senior Technical Engineer (CTA), the General Transport Manager (CTA), and representatives of the Ministry of Finance and the Department of Economic Planning and Statistics.

The review committee will assess the training plan of each Swazi roads engineer and will review the activities of the engineering technicians, evaluating their fitness and acceptance by the roads crews and supervisors, and needs for continuing education at the Swaziland College of Technology (SCOT). The committee will further review and evaluate the following;

(1) the maintenance contracting procedures and their effectiveness in eliminating the backlog of deadlined plant;

(2) the Roads/CTA preventive maintenance program, the training of the drivers in carrying their responsibilities to perform daily first echelon maintenance and the effectiveness of the CTA seconded maintenance crews to perform their function;

(3) the purchasing and disbursement procedures.

A separate meeting on water resources activities will be held between AID, Ministry of Finance and the Department of Economic

Planning and Statistics, and the Senior Water Engineer of the Water Resources Branch. The major areas of concern will be the contracting out of weir replacements, the progress on the procurement and installation of towers, recorders, and telemetric equipment, progress on the Branch's workplan to repair or replace weirs, and accuracy of data received from stations with damaged weirs.

A mid-project evaluation will take place in the fourteenth month of the project to assess the experiential training of the Swazi engineer and engineer technicians and set goals for the second year. USAID may wish to finance an experiential training expert to attend and offer suggestions to enrich the planned practical training being offered. To evaluate the maintenance contracts and the operational availability of plant and equipment, the project will finance the return visit of the equipment consultant who originally drafted the bid documents and advised on contracting.

The evaluation team will review the productivity of the rehabilitation units, identify key constraints to improved performance, and make recommendations to the Senior Roads Engineer. The evaluation of the water resources component will concentrate on the performance of installing AID-procured equipment, the status of weir repairs, and accuracy of data recorded, ways to improve performance, and the extent to which information flows have impacted on water resource management.

A final evaluation will be held at the end of the project and will concentrate on the progress made toward achievement of the end of project status. The on-the-job training of the Swazi engineers and engineer technicians will be assessed, especially their contribution to the improvement of roads quality, and potential for greater responsibilities.

The final evaluation will assess the success of the equipment maintenance contracts, exploring the internal mechanism of the contracts, make suggestions to improve upon them and create a model for continuation after the project has ended, and matching its performance against alternatives. The final point of consideration will be the extent to which the rehabilitation units complied with their objective to reconstruct at least 440 miles of gravel and earth roads, the problem and key constraints encountered, the manner in which these were surmounted, and recommendations for future maintenance efforts. As regards water resources, the evaluation will focus on the effective installation of AID-provided equipment and their use, the extent to which weir repairs were made and the use of the data, and the effect the equipment had on water management. The last part of the evaluation will concern beneficiaries: the nature, scope and direction of the benefits of the project.

Annex A

FM SECSTATE WASHDC
TO RUEHRB/AMEMBASSY MBABANE IMMEDIATE 3531
INFOR RUEHNR/AMEMBASSY NAIROBI PRIORITY 0803

UNCLAS STATE 206308

AIDAC NAIROBI FOR REDSO

E..O. 12356: N/A
SUBJECT: SWAZILAND RURAL RECONSTRUCTION PID (645-0224)

REFERENCE: (A) MBABANE 2135; (B) STATE 199236; (C) MBABANE 2250

1. SUMMARY: ECPR FOR SUBJECT PID WAS HELD ON JULY 12, 1984 AND CHAIRED BY 1. HAUSMAN, AFR/PD. DECISION WAS TO APPROVE THE PID AND AUTHORIZE THE MISSION TO COMPLETE THE PP. UNDER THE PROVISIONS OF DOA 140, MISSION MAY APPROVE THE PP AND AUTHORIZE THE PROJECT WITH REDSO/ESA CONCURRENCE. THE ECPR AGREED THAT THE CONCEPT OF SUPPORTING THE RECONSTRUCTION/REHABILITATION EFFORT WAS CONSISTENT WITH AID STRATEGY SWAZILAND AND THAT THIS ACTIVITY WAS WORTHY OF AID SUPPORT. ISSUES AND COMMENTS RAISED AT THE MEETING CONCERNED THE SCOPE OF THE OVERALL RECONSTRUCTION PROGRAM AND IN PARTICULAR, THE SCOPE OF AID SUPPORT FOR THIS EFFORT. THE FOLLOWING SUMMARIZES THE ECPR'S ISSUES AND RECOMMENDATIONS FOR ITEMS TO BE ADDRESSED IN THE PP.

2. THE FIRST ISSUE CONCERNED THE RATIONALE FOR AID SUPPORT OF THIS ACTIVITY. THE PID WAS UNCLEAR AS TO THE NATURE AND MAGNITUDE OF SUPPORT FROM OTHER DONORS, INCLUDING THE GOS. THE PP SHOULD PROVIDE SUBSTANTIAL DETAIL ON OTHER DONOR CONTRIBUTIONS AND HOW AID SUPPORT BITS INTO THE LARGER RECONSTRUCTION EFFORT.

3. THE SECOND ISSUE RAISED THE QUESTION OF SCOPE OF AID ISTITUTION-BUILDING ACTIVITIES, INCLUDING THE PROPOSED BUDGET AND TIMING CONSIDERATIONS. UNDER THIS ISSUE WERE SEVERAL CONCERNS/QUESTIONS: (A) AS ALREADY DISCUSSED WITH THE MISSION, THE PP SHOULD INCLUDE: DETAILS ON THE ACTIVITIES OF THE LONG AND SHORT-TERM ADVISORS; AN ANALYSIS OF THE CURRENT INSTITUTIONAL STRUCTURE WITHIN WHICH TA WILL WORK; AND A PLAN FOR RESPONSIBILITIES TO BE HANDED OVER TO SWAZI COUNTERPARTS AT THE END OF THE PROJECT. (B) THE PROJECT PURPOSE APPEARS TO BE OVERAMBITIOUS GIVEN THE LIMITED AID RESOURCES AND TWO-YEAR TIMEFRAME. THE PROJECT PAPER TEAM SHOULD EXAMINE WHETHER THE INSTITUTION-BUILDING OBJECTIVES AT THE PROJECT PURPOSE LEVEL ARE REALISTIC GIVEN THESE CONSTRAINTS AND THE EMERGENCY NATURE OF THE REPAIRS. THE ECPR RECOMMENDS THAT THE PROJECT BE KEPT AS SIMPLE AS POSSIBLE, AND THAT EXPECTATIONS OF LONG-TERM AID SUPPORT FOR INSTITUTION-BUILDING NOT BE RAISED UNDULY BY CLAIMING THAT OUR CONTRIBUTION OF TA AND EQUIPMENT WILL RESULT IN A PERMANENTLY UPGRADED GOS MAINTENANCE CAPACITY. GIVEN THE DISPARITY BETWEEN THE GOAL AND PURPOSE STATEMENTS AND THE FACT THAT ALL OF THE OUTPUTS ARE EXPRESSED IN TERMS OF PHYSICAL INFRASTRUCTURE IMPROVEMENTS, THE PP TEAM MAY WANT OT REVISE THE LOG FRAME AND DOWNPLAY LONGER TERM INSTITUTIONS-BUILDING IMPLICATIONS OF THE PROJECT. (C) THE ECPR

DISCUSSED THE MIX OF RESOURCES TO BE PROVIDED BY AID. THE MISSION MAY WISH TO VARY THE MIX OF COMMODITIES AND TA IF THE GOS OR OTHER DONORS CAN FUND TA, ESPECIALLY NON-US TA. (D) THE MISSION IS URGED TO INCLUDE A CP OR COVENANT IN THE PROJECT AGREEMENT TO ENSURE THAT THE GOS ASSIGNS QUALIFIED SWAZI COUNTERPART TO THE AID-FUNDED TA.

4. THE THIRD ISSUE RAISED QUESTIONS ON THE WAIVERS FOR T.A., SPARE PARTS, AND EQUIPMENT. THE ECPR NOTED THAT THE MISSION HAS THE AUTHORITY TO PROCESS THESE WAIVERS UNDER YOUR DOLS 1.0 MILLION LIMIT. THE ECPR RECOMMENDED, HOWEVER, THAT WHERE POSSIBLE, SPARE PARTS AND EQUIPMENT OF U.S. SOURCE AND ORIGIN SHOULD BE USED. IF CODE 935 NATIONALITY TA IS NECESSARY, IT MAY BE PREFERABLE TO USE OTHER DONOR OR GOS FUNDS TO FINANCE IT.

5. THE ECPR ALSO RECOMMENDED THE FOLLOWING ITEMS FOR INCLUSION IN THE PP.

(A) GOS CONTRIBUTION-A DETAILED BREAKDOWN OF RESOURCES TO BE PROVIDED BY THE GOS.

(B) A DISCUSSION OF THE NEED FOR AID ENGINEERING BACKSTOP SUPPORT OF THIS PROJECT AND THE SOURCE OF SUCH SERVICES.

(C) THE MISSION'S PLAN FOR OBTAINING ENGINEERING CONTRACT SERVICES. GIVEN THE LIMITED AMOUNT OF FUNDS AVAILABLE, ECPR AGREED PSC WOULD BE THE MOST APPROPRIATE OPTION.

(D) THE LIST OF EQUIPMENT ON LINES 472 TO 479 OF REFTEL A IS EXTENSIVE AND WILL REQUIRE SUBSTANTIAL INVESTMENTS TO KEEP THIS EQUIPMENT OPERATIONAL. AID PROVISION OF DOLS 500,000 IN SPARE PARTS CAN COVER ONLY A FRACTION OF THIS NEED AND ONLY FOR TWO YEARS. THEREFORE, PL SHOULD DISCUSS HOW AID-FUNDED SPARE PARTS WOULD BE UTILIZED AND WHAT STEPS HAVE BEEN/WILL BE TAKEN BY GOS OR OTHER DONORS TO BRING REMAINING EQUIPMENT TO OPERATIONAL READINESS. GOS PLANS TO MAINTAIN THIS EQUIPMENT SHOULD ALSO BE DISCUSSED.

(E) WE ASSUME THAT THE GOS ALREADY HAS IDENTIFIED PRIORITIES FOR ROAD REPAIR NECESSITATED BY CYCLONE DOMOINA. THE PP SHOULD PROVIDE AN ILLUSTRATIVE LIST OF ROADS TO BE RECONSTRUCTED, EQUIPMENT NEEDED, STANDARDS TO BE USED, ESTIMATED MILEAGES, COST PER MILE/KM, AND CRITERIA USED TO DETERMINE ORDER OF PRIORITY FOR ROAD REPAIR WORK.

(F) ECONOMIC ANALYSIS: THE ANALYSIS SHOULD PROVIDE MORE SPECIFIC DETAILS ON THE EXPECTED IMPACT ON DIRECT BENEFICIARIES, AS WELL AS ON THE ECONOMY AS A WHOLE, EG WHAT AREAS/CROPS WILL BE SERVED BY REPAIRED ROADS.

(G) SOCIAL ANALYSIS: THE ANALYSIS ALSO SHOULD PROVIDE MORE SPECIFICS ON DIRECT BENEFICIARY PROFILE AND THE LIKELY EFFECTS OF THE PROJECT ON THIS GROUP. DAM

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PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

NARRATIVE SUMMARY: GOAL	MEASURES OF GOAL ACHIEVEMENT (1)	MEASURES OF VERIFICATION	IMPORTANT ASSUMPTIONS
To rehabilitate the infrastructure of the country to a state comparable to that which existed prior to Cyclone Domoina	1. Infrastructure repaired to a sufficiently high standard that goods, services, and people can circulate in a manner comparable to that existent prior to the cyclone. 2. All bridges have been permanently repaired; bailey bridges removed and replaced by permanent structures. 3. All damaged paved roads, including associated drainage, have been repaired; all gravel/earth roads damaged by the cyclone have been repaired. 4. River gauging stations have been permanently repaired; all damaged weirs, towers, recording telemetry devices have been repaired or replaced.	1. Visual inspection. 2. GOS records.	1. Continuing high GOS budget allocation in FY 1985 and 1986. 2. No additional flood damage. 3. Foreign donor financial assistance on grant or loan terms (either concessions or commercial).

(1) Goals 2, 3 and 4 represent the ultimate goal of reconstruction, but they cannot be achieved completely during the time frame of this project.

NARRATIVE SUMMARY: PURPOSE	END OF PROJECT STATUS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
To assist the GOS (1) improve its capabilities to repair and maintain unpaved roads damaged by Cyclone Domoina (2) to reestablish its capacity to monitor and allocate water resources.	1. 1/3 of cyclone damaged unpaved roads rehabilitated. 2. Three Swazi Engineers with improved engineering skills and supervisory abilities. 3. Repairs to plant and equipment take half the time planned normally existed prior to the project; 75 percent plant equipment are operational (on an average annual basis). 4. Flood damaged river gauging stations are reporting usable data.	Site visits. Engineering Reports. Road Counts. Water Level Readings.	GOS's second year budget for roads rehabilitation units equals or surpasses first year's. Swazi Engineers remain in GOS employ. Damaged weirs are correctly assessed to allow extrapolation of data.

NARRATIVE SUMMARY: IMPORTANT OUTPUTS	MAGNITUDE OF OUTPUTS	MEANS OF VERIFICATION	ASSUMPTIONS
1. Trained Swazi Engineers better able to design, manage, and supervise road repairs and maintenance. 2. System established in Roads Branch to handle reconstruction of cyclone-damaged roads. 3. Equipment assigned to rehabilitation units is operational greater percentage of time (average operation availability of Roads Branch at present is 40 percent). 4. At least 80 percent of river gauging stations damaged by Cyclone Domoina are reportedly usable river flow data.	1. Three Swazi, two of which were AID-participants. 2. Average operational availability is at least 75%. 3. 80% of cyclone damaged stations.	Personnel Evaluations. Vehicle Maintenance Trading System. Water Flow Data. Vouchers for Payment of Contractors. Work Orders for Maintenance Contract. Existence of maintenance contract.	Cooperation between CTA and Roads. Quickness with which workers in Roads Branch redirect skills from regraveling to rehabilitation. Water Resources can contract out weir replacement.

NARRATIVE SUMMARY: INPUTS	MEASURE OF INPUT ACHIEVEMENTS	MEASURES OF VERIFICATION	IMPORTANT ASSUMPTIONS
A. Roads Component 1. U.S. Input -technical ASSISTANCE -maintenace contracts	a. 4 person years of long term technical assistance ($500,000) b. 5 person months of short term technical assistance ($65,000)	a. contractor reports b. monitoring committee reports c. project evaluation d. observation	
2. U.K. Input Technical Assistance	c. several time and materials contract let with the private sector ($500,000)		
3. GOS Input Maintenance and Construction units operations	$2,714,000		
B. Water Resources Components 1. U.S. Input Technical Assitance -commodities	short term technical assistance contract (construction) ($12,000) $173,000		
2. GOS Input Weir construction		$144,000	

5C(2) PROJECT CHECKLIST

Listed below are statutory criteria applicable to projects. This section is divided into two parts. Part A. includes criteria applicable to all projects. Part B. applies to projects funded from specific sources only: B.1. applies to all projects funded with Development Assistance Funds, B.2. applies to projects funded with Development Assistance loans, and B.3. applies to projects funded from ESF.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?

Yes. See Swaziland Manpower Development Project (645-0218) Project Paper Annex C.

Yes, attached.

A. GENERAL CRITERIA FOR PROJECT

1. FY 1982 Appropriation Act Sec. 523; FAA Sec. 634A; Sec. 653(b).

   (a) Describe how authorizing and appropriations committees of Senate and House have been or will be notified concerning the project; (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than $1 million over that amount)?

   (a) A Congressional Notification to authorize this Project at the FY84 obligation level of $1.25 Million was transmitted to the Congress on July 26, 1984. The waiting period expired on August 10, 1984, without objection being raised.

   (b) Yes.

2. FAA Sec. 611(a)(1). Prior to obligation in excess of $100,00, will there be

(a) engineering, financial or other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?	(a) Yes. (b) Yes.
3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?	No specific legislative action is required.
4. FAA Sec. 611(b); FY 1982 Appropriation Act Sec. 501. If for water or water-related land resource construction, has project met the standards and criteria as set forth in the Principles and Standards for Planning Water and Related Land Resources, dated October 25, 1973? (See AID Handbook 3 for new guidelines.)	Not applicable.
5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed $1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project?	Project is not for capital assistance (e.g. construction).

6. FAA Sec. 209. Is project susceptible to execution as part of regional or multilateral project? If so, why is project not so executed? Information and conclusion whether assistance will encourage regional development programs.	No.
7. FAA Sec. 601(a). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; and (c) encourage development and use of cooperatives, and credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.	Primarily, this Rural Reconstruction Project will improve technical efficiency in industry, agriculture and commerce in rural areas -(e). It also will encourage GOS trends to use the Swazi private sector for those activities it can more effectively accomplish, the repair and maintenance of GOS Roads Branch equipment-(b). The rehabilitation of rural gravel and earth roads will reduce the current cost of transportationing agricultural imputs and farm production, increasing profitability for both the small- and large-scale farmers and the firms supplying seeds, fertilizer, and pesticides. The water resources component will assist in the expansion of small-scale irrigation schemes.
8. FAA Sec. 601(b). Information and conclusions on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).	The Project will finance U.S. long- and to a lesser extent U.S. short- technical assistance, as well as the purchase of some U.S. manufactured commodities.

9.	FAA Sec. 612(b), 636(h); FY 1982 Appropriation Act Sec. 507. Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars.	Swaziland will contribute an estimated 65.5% of the total cost of the Project which respresents both foreign exchange and local currency costs (including in-kind support). The U.S. does not own excess Swazi currency.
10.	FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release?	No excess Swazi currency is owned by the U.S.
11.	FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?	Yes.
12.	FY 1982 Appropriation Act Sec. 521. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity?	Not applicable.
13.	FAA 118(c) and (d). Does the project comply with the environmental procedures set forth in AID Regulation 16? Does	Yes.

the project or program take into consideration the problem of the destruction of tropical forests?	Not applicable.
14. FAA 121(d). If a Sahel project, has a determination been made that the host government has an adequate system for accounting for and controlling receipt and expenditure of project funds (dollars or local currency generated therefrom)?	Not applicable.

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FAA Sec. 102(b), 111, 113, 281(a). Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using the appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and	The rehabiliation of rural gravel and earth roads will reduce the current cost of transporting agricultural imputs and farm production, increasing profitability for both the small- and large-scale farmer. This work will involve the use of labor intensive production and appropriate technology for such effort. The water resources conponent will assist in the expansion of small-scale irrigation schemes. This rural rehabilitation effort favorably impacts all rural society by encouraging the increased flow of goods, services and people. Access to clinics, schools, government offices, and small rural commercial centers will be increased. The Project benefits those who seek to increase agricultural production by new or expanded irrigation schemes, thereby increasing commercialization with its rural employment generation effects.

otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries?	
b. FAA Sec. 103, 103A, 104, 105, 106. Does the project fit the criteria for the type of funds (functional account) being used?	The Project fully meets the criteria of FAA Section 103.
c. FAA Sec. 107. Is emphasis on use of appropriate technology (relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor)?	Yes, particularly in the roads rehabilitation component.
d. FAA Sec. 110(a). Will the recipient country provide at least 25% of the costs of the program, project, or activitiy with respect to which the assistance is to be furnished (or is the latter cost-sharing requirement being waived for a "relatively least developed" country)?	Yes. 65.5% of the estimated total cost of the Project represents the GOS contribution.

e. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing, or is the recipient country "relatively least developed"? (M.O. 1232.1 defined a capital project as "the construction, expansion, equipping or alteration of a physical facility or facilities financed by AID dollar assistance of not less than $100,000, including related advisory, managerial and training services, and not undertaken as part of a project of a predominantly technical assistance character."	No. This is not a capital assistance Project.
f. FAA Sec. 122(b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth?	Yes. See discussion under B.1. above.
g. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage	This Project represents AID's longer-term, measured response to the natural disaster caused by Cyclone Domoina, following our initial emergency relief efforts. The GOS rehabiliation effort resulting from the disaster remains the most pressing concern of the Government and its highest development priority.

institutional development; and supports civil education and training in skills required for effective participation in governmental processes esential to self-government.

2. Development Assistance Project Criteria (Loans Only) — Not applicable. This is not a loan-financed project.

   a. FAA Sec. 122(b). Information and conclusion on capacity of the country to repay the loan, at a reasonable rate of interest. — Not applicable.

   b. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete with U.S. enterprises, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan? — Not applicable.

   c. ISDCA of 1981, Sec. 724 (c) and (d). If for Nicaragua, does the loan agreement require that the funds be used to the maximum extent possible for the private sector? Does the project provide for monitoring under FAA Sec. 624(g)? — Not applicable.

3. Economic Support Fund Project Criteria — The project is not financed under the Economic Support Fund.

   a. FAA Sec. 531(a). Will this assistance promote economic or political — Not applicable.

	stability? To the extent possible, does it reflect the policy directions of FAA Section 102?	
b.	FAA Sec. 531(c). Will assistance under this chapter be used for military, or paramilitary activities?	Not applicable.
c.	FAA Sec. 534. Will ESF funds be used to finance the construction of the operation or maintenance of, or the supplying of fuel for, a nuclear facility? If so, has the President certified that such use of funds is indispensable to nonproliferation objectives?	Not applicable.
d.	FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made?	Not applicable.

5C(3) - STANDARD ITEM CHECKLIST

Listed below are the statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the agreement by imposing limits on certain uses of funds.

These items are arranged under the general headings of (A) Procurement, (B) Construction, and (C) Other Restrictions.

A. Procurement

1. FAA Sec. 602. Are there arrangements to permit U.S. small business to participate equitably in the furnishing of commodities and services financed?	Yes.
2. FAA Sec. 604(a). Will all procurement be from the U.S. except as otherwise determined by the President or under delegation from him?	Yes.
3. FAA Sec. 604(d). If the cooperating country discriminates against marine insurance companies authorized to do business in the U.S., will commodities be insured in the United States against marine risk with such a company?	Swaziland does not discriminate against U.S. merchant marine insurance companies.
4. FAA Sec. 604(e); ISDCA of 1980 Sec. 705(a). If offshore procurement of agricultural commodity or product is to be	Not applicable.

financed, is there provision against such procurement when the domestic price of such commodity is less than parity? (Exception where commodity financed could not reasonably be procured in U.S.)	
5. FAA Sec. 604(g). Will construction or engineering services be procured from firms of countries otherwise eligible under Code 941, but which have attained a competitive capability in international markets in one or these areas?	Not applicable.
6. FAA Sec. 603. Is the shipping excluded from compliance with requirement in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S. flag commercial vessels to the extent that such vessels are available at fair and reasonable rates?	The Project will comply with this section through provisions in the Project Grant Agreement, Project Implementation Letters, and in implementing contracts.
7. FAA Sec. 621. If technical assistance is financed, will such assistance be furnished by private enterprise on a contract basis to the fullest extent practicable? If the facilities of other	Yes.

Federal agencies will be utilized, are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs?	
8. International Air Transport. Fair Competitive Practices Act, 1974. If air transportation of persons or property is financed on grant basis, will U.S. carriers be used to the extent such service is available?	Yes.
9. FY 1982 Appropriation Act Sec. 504. If the U.S. Government is a party to a contract for procurement, does the contract contain a provision authorizing termination of such contract for the convenience of the United States?	Any direct AID contract under the project will contain such a provision.
B. Construction	
1. FAA Sec. 601(d). If capital (e.g., construction) project, will U.S. engineering and professional services to be used?	This is not a capital assistance project.
2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable?	Not applicable. No construction will be financed under the project

3. FAA Sec. 620(k). If for construction of productive enterprise, will agggregate value of assistance to be furnished by the U.S. not exceed $100 million (except for productive enterprises in Egypt that were described in the CP)?	Not applicable. There will be no construction of a productive enterprise under the project.

C. Other Restrictions

1. FAA Sec. 122(b). If development loan, is interest rate at least 2% per annum during grace period and at least 3% per annum thereafter?	This is not a loan-financed project.
2. FAA SEc. 301(d). If fund is established solely by U.S. contributions and administed by an internatioal organization, does Comptroller General have audit rights?	Not applicable.
3. FAA Sec. 620(h). Do arrangements exist to insure that United States foreign aid is not used in a manner which, contrary to the best interests of the United States, promotes or assists the foreign aid projects or activities of the Communist-bloc countries?	Yes.
4. Will arrangements preclude use of financing:	(1) Yes.
a. FAA Sec. 104(f); FY 1982 Appropriation Act Sec. 525: (1) To pay for performance of abortions as a method of family	

planning or to motivate or coerce persons to practice abortions; (2) to pay for performance of involuntary sterilization as method of family planning, or to coerce or provide financial incentive to any person to undergo sterilization; (3) to pay for any biomedical research which relates, in whole or part, to methods or the performance of abortions or involuntary sterilizations as a means of family planning; (4) to lobby for abortion?	(2) Yes. (3) Yes. (4) Yes.
b. FAA Sec. 620(g). To compensate owners for expropriated nationalized property?	Yes.
c. FAA Sec. 660. To provide training or advice or provide any financial support for police, prisons, or other law enforcement forces, except for narcotics programs?	Yes.
d. FAA Sec. 662. For CIA activities?	Yes.
e. FAA Sec. 636(i). For purchase, sale, long-term lease, exchange or guaranty of the sale of motor vehicles manufactured outside U.S., unless a waiver is obtained?	Yes.
f. FY 1982 Appropriation Act, Sec. 503. To pay pensions, annuities, retirement pay, or	Yes.

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adjusted service compensation for military personnel?	
g. FY 1982 Appropriation Act, Sec. 505. To pay U.N. assessments, arrearages or dues?	Yes.
h. FY 1982 Appropriation Act, Sec. 506. To carry out provisions of FAA section 209(d) (Transfer of FAA funds to multilateral organizations for lending)?	Yes.
i. FY 1982 Appropriation Act, Sec. 510. To finance the export of nuclear equipment, fuel, or technology or to train foreign nationals in nuclear fields?	Yes.
j. FY 1982 Appropriation Act, Sec. 511. Will assistance be provided for the purpose of aiding the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights?	No.
k. FY 1982 Appropriation Act, Sec. 515. To be used for publicity or propaganda purposes within U.S. not authorized by Congress?	

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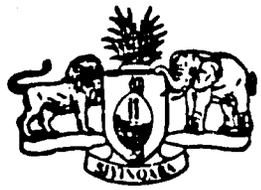
Annex D-I
(with attachments)

SWAZILAND  GOVERNMENT

Dept. of Economic Planning and
Statistics,
P. O. Box 602,
MBABANE.

REF:ECO.C/19/92

27th April, 1984

Mr. R. Huesmann,
USAID/Swaziland,
P. O. Box 750,
M B A B A N E.

Dear Mr. Huesmann,

FINANCIAL ASSISTANCE FOR THE CYCLONE DAMAGES TO THE WATER RESOURCES EQUIPMENT

I enclose an application for emergency funding for the reconstruction of River Gauging Stations destroyed by Cyclone Domoina from 28th January, 1984 to 1st February, 1984 submitted to us by the Ministry of Natural Resources, Land Utilization and Energy for your sympathetic consideration. The reconstruction cost is estimated at E400,100.

I should be grateful if USAID/Swaziland could provide financial assistance for the rehabilitation of our Water Resources equipment as detailed in the abovementioned project document.

Yours sincerely

V.E. SIKHONDZE
PRINCIPAL SECRETARY

NO 329/84
ACTION OFFICE Dir PKM
DUE DATE 5/10
ACTION TAKEN
FIL # 42
DATE 7/9/84
INFO PRM-400
FILE 0224

cc. Principal Secretary
Natural Resources, Land Utilization and Energy

VES/tsd

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WATER RESOURCES BRANCH
MINISTRY OF NATURAL RESOURCES
GOVERNMENT OF SWAZILAND
MBABANE, SWAZILAND

APPLICATION FOR EMERGENCY FUNDING FOR RECONSTRUCTION OF RIVER GAUGING STATIONS DESTROYED BY CYCLONE DOMOINA

JANUARY 28, 1984 TO FEBRUARY 1, 1984

Submitted to:

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

MBABANE, SWAZILAND

APRIL 16, 1984

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APPLICATION FOR EMERGENCY FUNDING FOR RECONSTRUCTION OF RIVER GAUGING STATIONS DESTROYED BY CYCLONE DOMOINA JANUARY 28, 1984 TO FEBRUARY 1, 1984

INTRODUCTION AND SUMMARY

This document contains an application from the Water Resources Branch (WRB) of the Ministry of Natural Resources, Government of Swaziland to the United States Agency for International Development (USAID) for emergency funding for reconstruction of river gauging stations destroyed by Cyclone Domoina. The damage occurred between January 28, 1984 and February 1, 1984.

Water is the most important renewable resource in Swaziland. Water is the key to agricultural development, which is the backbone of the Swazi economy at the present time and for the foreseeable future.

The Water Resource Branch is responsible for assessment, apportionment and conservation of the surface water resources of Swaziland. Successful management depends on complete and accurate and timely measurement of the volume of water flowing in the rivers of Swaziland. This resource must be apportioned between developments within the country as well as demands and obligations for water by Mocambique and the Republic of South Africa. To perform this task, 42

gauging stations have been constructed at important sites on the main rivers and principal tributaries throughout Swaziland since 1954. Cyclone Domoina destroyed 33 of these stations, 79% of the monitoring system.

The WRB is unable to perform it's designated functions because of the damage caused by the cyclone. Without external assistance, reconstruction will require about 10 years. During this period, development in Swaziland will be hampered by lack of data, and negotiations with neighboring countries regarding international apportionment of water resources will be handicapped.

FUNCTION OF THE WATER RESOURCE BRANCH

The designated function of the WRB is to assess, apportion, and conserve the surface water resources of Swaziland. To fulfill this function, the WRB monitors and records the flow of water in the country's rivers where they enter the country from the Republic of South Africa along the western border and where the rivers leave Swaziland, discharging to the Republic of South Africa along the northern border and to Mocambique along the eastern border. Border stations account for about 25% of the monitoring system. The remaining stations are used for data collection, internal management and apportionment.

A typical gauging station consists of a concrete structure placed in the river channel and instruments for measuring the level of water in the river. The structure, called a weir, gives the river channel dimensions which can be easily measured. The height of the water passing over the weir can be measured with a float and recorded on a strip chart recorder, giving a permanent record of the river level. The width of the flow, controlled by the weir, and the level, measured by the float and recorder, give the cross-sectional area of flow, which is converted to volume by discharge equations calibrated to the particular weir. The technique and instrumentation are nearly identical to that used by the United States Geological Survey since the turn of the century.

RELATION OF RIVER GAUGING TO DEVELOPMENT

All development, but particularly agricultural development, depends on the availability of an adequate supply of water. Demands for water by any proposed new development must be evaluated in light of the available supply and existing development. Where the water supply is under utilized or under estimated, waste occurs. When demand for water approaches the average supply, shortages will occur in dry years. When demand exceeds the available supply, economic losses are inevitable.

Demand must be balanced against the available supply. A water balance accounts for all natural in-flow and out-flow from a basin, as well as for modifications of the natural system by man. River-flow records are essential for creating a water balance. Accurate measurement of river-flow becomes more critical as the basin develops and competition for water increases. Historic records are important because the effects of a proposed development on the available supply can be evaluated by studying the response of the hydrologic system to stresses caused by an existing development. Gaps in the record diminish its reliability and usefulness. Gaps in a data record can be dealt with statistically, but this never creates the confidence that comes with real data.

River-flow measurement also is critical in structuring international agreements on water allocation in river basins which have not been apportioned by treaty, and in monitoring compliance with international agreements on water resource allocations which have been negotiated. In basins in which water apportionment has been agreed by treaty, apportionment is often based on the a percentage of flow at a particular gauging station. Where stations have been destroyed, the agreements cannot be enforced, flows can not be monitored and waste of water ensues.

Swaziland shares four of it's five major rivers with the Republic of South Africa. Despite attempts at negotiation, no agreement has been reached with the Republic on the apportionmnet of water in any of these basins. In recent years, the volume of water released by the Republic of South Africa to Swaziland has decreased due to industrial and agricultural development in the Republic. The effects of development in the Repubic on Swaziland's water resources could be serious and must be documented in order to strengthen Swaziland's position in negotiation with the Republic on flow apportionment and development needs.

As demands on the hydrologic system increase, precision of measurement and the quality of the record must increase, to permit maximum effective utilization of the available resource without overcommitment. Planning for the utilization of Swaziland's water resources cannot proceed effectively without functioning river gauging stations.

DAMAGE CAUSED BY CYCLONE DOMOINA

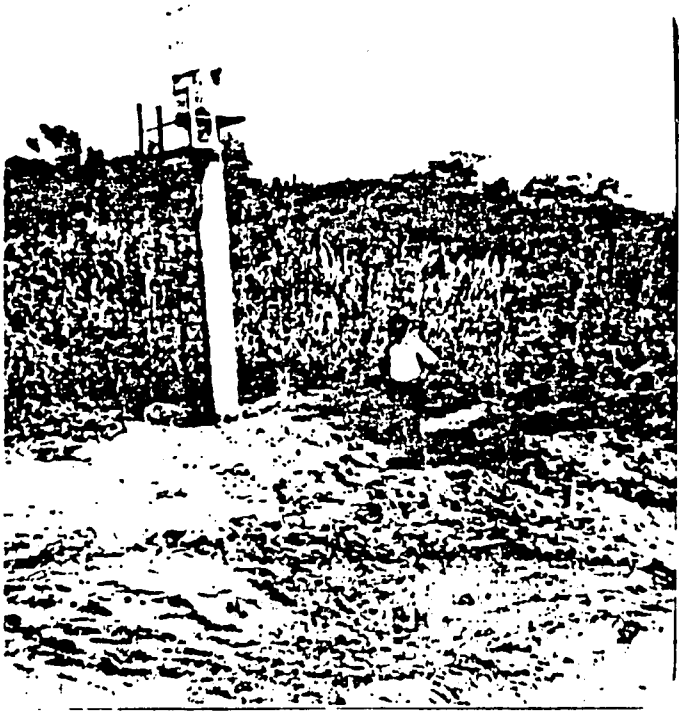
Many gauging station towers, which had been in service since the late 1950's and early 1960's, were swept off of their foundations and destroyed by Cyclone Domoina. Thirty-three of forty-two stations in the WRB river gauging system were severely damaged or destroyed by flooding caused by rains accompanying the cyclone. In most cases, the instruments contained in the towers have not been found, and may have been swept out of the country by the flood. In some cases, the weirs themselves have been damaged by boulders and tree stumps transported by the flood. The abutments of some weirs have been scoured out, so that flow now by-passes the gauging structure. The damage to the weirs cannot be fully assessed because rains since the cyclone have caused river levels to remain high, obscuring the most vulnerable central bays of the weirs.

The photos on page 8 show the pre-cyclone condition and the damage to the tower at gauging station GS-10, near Mpisi Farms. This station is one of two gauging stations in the Mbuluzi Basin used to determine Swaziland's obligation to deliver water to Mocambique. This basin supplies water to the city of Maputo, and Mocambique is entitled, by international agreement, to 40% of the flow which passes this station. A Stevens stripchart recorder, worth

E3,500.00, can be seen inside the tower chamber. These recorders, manufactured in Beaverton, Oregon, are the key instruments in the WRB river gauging system. The estimated cost of restoring this station to pre-cyclone condition is E24,500.00.

Prior to the cyclone, the WRB telemetry system contained 8 stations which monitored flows in the Mbuluzi Basin, the operation of Mnjoli Dam and diversions for irrigation by Simunye Estates. One station, the tower at Mnjoli Dam, functioned throughout the event. Three stations, GS-10, GS-32 and the Simunye Weir were destroyed. The remaining four stations have been repaired and are at least partly operational.

An estimate of the damage is caused by Cyclone Domoina presented in Table 1. The table lists the damage to weirs, including repair or replacement of concrete structures and removal of newly deposited silt on the upstream side of the weirs. Replacement and installation costs for towers, recorders and telemetry are also presented. All costs are estimated contractor costs at 1984 prices.



Gauging station 10, December 14 1983.

Gauging station 10, February 2, 1984.

TABLE 1. SUMMARY OF DAMAGE TO WATER RESOURCES BRANCH RIVER GAUGING SYSTEM AND ESTIMATE OF THE COST OF REPAIR.

BASIN	STATION	YEAR BUILT	WEIR DAMAGE	COST	TOWER DAMAGE	COST	RECORDER DAMAGE	COST	TELEMETRY STATION DAMAGE	COST	TOTAL COST
LOMATI	GS-11	1955	Right flank destroyed. Repair by Ngonini Estates		Destroyed	9000	Destroyed	3500			12500
	GS-34	1981	Damaged	4000	Destroyed	1000	Recovered, but	3500			8500
KOMATI	GS-29	1977	OK		OK		OK		NA		
	GS-30	1978	Damaged	36000	Destroyed	1000	Destroyed	3500	NA		40500
	GS-42	1980	OK		OK		OK				0
MBULUZI	GS- 4	1960	Destroyed	15000	OK		OK				15000
	GS- 3	1959	Damaged	5000	Slightly Damaged	1000	Slightly damaged	800			6800
	GS-10	1964	Damaged	5000	Destroyed	9000	Destroyed	3500	Destroyed	7000	24500
	Simunye weir		Badly damaged Repair by Simynye Estates		Destroyed	2000	Destroyed		Destroyed	12000	14000
	GS-32	1980	Slightly damaged	1500	Destroyed	1000	Destroyed	3500	Destroyed	7000	13000
	GS-20	1973	Slightly damaged not to be replaced		Destroyed		Destroyed		NA		0
	GS-35	1974	Slightly damaged	1500	Damaged	500	Destroyed	3500	NA		5500
	GS-36	1977	OK		OK		OK				0
	GS-37	1975	OK		OK		Slightly damaged	800			800

	GS-38	1976	Slightly damaged	1500	OK		OK		1500
	GS-40	1975	OK		OK		OK		0
	GS-41	1975	OK		OK		OK		0
USUTU									0
	GS-33	1979	OK		OK		OK		0
	GS-15	1967	OK		OK		OK		0
	GS- 2	1959	Badly damaged	7000	OK		OK		7000
	GS-24	1976	OK		OK		OK		0
	GS-23	1977	OK		OK		OK		0
	GS-31	1979	OK		OK		OK		0
	GS- 9	1962	Damaged	5000	OK		OK		5000
	GS-14	1968	Destroyed	18000	Destroyed	9000	Destroyed	3500	NA 30500
	GS- 6	1953	Slightly damaged	5000	Destroyed	9000	Destroyed	3500	NA 17500
	GS-16	1968	Control section Weir not yet built	1000	Destroyed	9000	Destroyed	3500	13500
	GS-21	1974	Damaged	1000	OK		OK		1000
	GS-22	1974	OK		OK		OK		0
	GS-28	1977	Destroyed not to be replaced						
	GS- 5	1962	Slightly damaged	2000	Slightly damaged	2000	OK		NA 4000
	GS-39	1981	OK		Destroyed	1000	Destroyed	3500	NA 4500

GS-25	1976	Damaged To be relocated	30000	Destroyed	9000	Destroyed	3500	NA	42500
GS- 7	1961	Damaged	2000	Destroyed	9000	Destroyed	3500	NA	14500
GS-12	1965	Destroyed	15000	Destroyed	9000	Destroyed	3500	NA	27500
GS-19	1970	Destroyed	25000	Destroyed	9000	Destroyed	3500	NA	37500
GS-13	1697	Slightly damaged	10000	Destroyed	9000	Destroyed	3500	NA	22500
GS-27	1977	Destroyed Not to be replaced		Destroyed		Destroyed			0
GS- 8	1960	Destroyed	30000	Destroyed	9000	Destroyed	3500		42500
TOTALS			220500		108500		57600	26000	

TOTAL E 400100

Annex D -II
(with attachments)

SWAZILAND **GOVERNMENT**

The Prime Minister's Office,
Department of Economic Planning and Statistics,
P.O. Box 602,
MBABANE.

NO. 175/84
ACTION OFFICE PRM
FILE REF 3/19
ACTION TAKEN Call in
RED80/50a Eng
adams 5/3
Letter to Sikhondze
CHK - R/F 3/19
FILE SOC E-1

Our ref.ECO.C.19 7th February, 1984

Mr. R. Huesmann,
The Director,
U.S.A.I.D.,
P.O. Box 199,
MBABANE.

Dear Mr. Huesmann,

REHABILITATION OF ROAD NETWORK DAMAGED BY THE CYCLONE DOMOINA

As part of the measures planned to reconstruct the road network damaged by the recent cyclone domoina in the Kingdom, the Government of Swaziland hereby solicits some assistance from the US Government through your agency.

I enclose for your perusal and favourable consideration a copy of a memorandum R551 dated 5th March 1984 from the Principal Secretary Ministry of Works and Communications to this Department.

Government attaches high priority to this programme as the road network is the backbone of the entire transport system in the country.

Your earliest and favourable consideration to this request will be highly appreciated.

Yours sincerely,

V.E. SIKHONDZE
PRINCIPAL SECRETARY

Enclosure
VES:tgk

C.C. Permanent Secretary Disaster Committee.

Memorandum

FORM No. P 73

From:
PRINCIPAL SECRETARY,
MINISTRY OF WORKS AND
COMMUNICATIONS.

To:
PRINCIPAL SECRETARY,
DEPT. OF ECONOMIC PLANNING.

Date 5th March, 1984

Our Ref. R551

Your Ref.

THE ROADS BRANCH REHABILITATION PROGRAMME.

The Roads Branch is currently working on the planning of its rehabilitation programme on damages caused by Cyclone Domonia. Now that the emergency opening of major routes has made such progress, the Branch is currently making a detailed inventory of damages to the road network, with the help of the 3 British Disaster Relief Engineers and Engineers on loan from the Ministry of Natural Resouces. It is also preparing rehabilitation project packages which will be forwarded to your Department suitable for submission to Donors. The proposal is subdivided into

(a) rebuilding of damaged structures such as the Big Bend Bridge and specific reconstruction of Roads like the Grand Valley Road which are all likely to be contracted out; and

(b) rehabilitation of road stretches requiring rebuilding of the drainage system or regravelling of surfaces which would be implemented both by Contract and in house.

However it is evident that much of the rehabilitation work particularly the smaller but equally important work will have to be carried out by the Roads Branch in-house. This will involve some restructuring within the Branch as well as additional inputs of technical know-how and plant if the Branch is to make full use of its own resouces.

Attached is a brief preliminary proposal of these changes as well as details of the extra inputs required by the Branch for its in-house rehabilitation programme.

It has been brought to our attention that the U.S. Government is interested in helping the Branch in this manner. Therefore we hope your Department will agree to the basic structure of our rehabilitation plans and will forward an official request for assistance along these lines to U.S. AID.

Grateful for your cooperation.

G. F. DHANJI
DEPUTY PRINCIPAL SECRETARY

c.c. Permanent Secretaries Disaster Committee.

11

PROJECT TO STRENGTHEN THE ROADS BRANCH STAFFING AND EQUIPMENT TO MEET THE NEEDS OF ITS IN-HOUSE REHABILITATION PROGRAMME

BACKGROUND

The Roads Branch is responsible for the country's proclaimed road network and as such for its rehabilitation after the cyclone. Under normal circumstances it carries out all necessary maintenance activities itself. Periodic regravelling and resealing works are carried out by three gravelling units and one bitumen while routine maintenance is done locally from 18 roads camps organised from four district depots. The Branch also has its own District and Rural Roads construction units but all major construction work is carried out by contractors supervised by consultants.

Recently the capabilities of the Branch were strenghened with the help of the Third World Bank Highway loan (1979-1983). Funds were provided both for technical assistance and training and maintenance equipment. The technical assistance consisted of 168 man months of consulting services devoted to a reorganisation study and training in all aspects of road maintenance. A course was also conducted to train highway technicians. In addition a quantity of plant and equipment was procured such that the branch had sufficient to carry out its maintenance duties. The result of the loan was a strengthened institution and a considerable improvement in the efficiency of its activities.

The damage to the roads network by the cyclone has placed great demands on the Roads Branch. The emergency programme to open up the roads immediately after the cyclone made use of the resources (manpower and equipment) of other government ministries especially Agriculture, but these have their own responsibilities and cannot give more than short term assistance.

OBJECTIVE

The scope and scale of the necessary rehabilitation works that have to be carried out on the roads network within the next two years or so means that much work will have to be given to outside contractors. Despite this, the Roads Branch will have to shoulder a considerably increased workload. This will involve rehabilitation work carried out by its own units as well as supervision of outside contractors. To carry out this task effectively and to bring about an institutionally strengthened Roads Branch will involve certain organisational changes to cope with the change circumstances.

By necessity these circumstances will also involve some additional inputs if the branch is to make full use of its own resources. Two areas in particular will require strengthening - one, the technical know-how at the branch's desposal two plant and equipment.

REORGANISATION

a) General

It is the intention to maintain the existing structure of the branch as far as possible with minimum interference to the 17 work camps responsible for the routine maintenance of their locality. Consequently the in-house rehabilitation work is likely to centre on the three gravel units and the District roads construction unit, with one unit being based in each district each capable of rehabilitating 80-100 kms a year. It is also intended to set up a smaller more mobile unit in each District concentrating on rapid repairs to damaged drainage structures.

b) Technical Assistance

Given the increased workload of the branch, it is evident that the branch will be criticaly short of engineering skills. At present there are five engineering posts within the Branch of which two are filled by cadet engineers. It is felt that for the rehabilitation period the service of three extra engineers will be required, one for design and two for supervisory purposes.

The posts for this are as follows:-

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1) Design

Although major reconstruction works are likely to go out to tender, there will be considerably increased demand for design services within the branch particularly for the rehabilitation of drainage structures - perhaps minor in themselves but cumulatively of major importance.

The Branch's design office is staffed by recently qualified technicians who critically need the supervision and assistance of an experienced engineer to carry out their responsibilities. Thus this engineer will assist in training for the long term needs of the branch as well as help with immediate design tasks.

2) Supervision

The increased workload of the Branch brought about by the existence of four rehabilitation units plus extra contract work will require close supervision if standards are to be maintained. It is estimated that the services of at least two more engineers will be required for the rehabilitation period. Again a major element of their work will be to oversee the cadet engineers and technicians so that they gain experience from the rehabilitation programme.

c) Plant

Before the cyclone, the Branch possessed a wide range of plant which, given good availability would have been sufficient for its needs. Unfortunately a combination of old equipment particularly for the construction unit and problems with maintenance reduced availability to such an extent that the end result was very low production.

The rehabilitation programme demands an improvement in plant availability. Furthermore the rehabilitation work, being of a different nature, involves a different mix of plant to that required for routine maintenance. Consequently the Roads Branch now requires

1) Plant Assessment study

An immediate study is necessary to assess existing plant compliment with a view to constituting balanced teams for the rehabilitation programme. The study will involve recommendations on the composition of these teams and what is required to achieve this. This latter task will necessitate an assessment of existing plant, what should be boarded and what can be overhauled from which it can be concluded what plant has to be procured.

2) Plant overhaul and purchase

Given the acceptable results of the study, a project can be formulated which will lead to the upgrading of plant such that the Road's Branch plant is sufficient to meet the needs of the rehabilitation programme. The project will provide funds for the overhaul of existing items of plant and purchase of new plant as recommended by the study.

Annex E

ADMINISTRATIVE ANALYSIS

Summary: By its nature, this project seeks to restore or rehabilitate road and water gauging networks to those conditions existing prior to the Domoina disaster. Current administrative structures exist under which the original networks were successfully constructed, maintained, and utilized. Thus, qualified individuals do exist in positions established within the three governmental entities responsible for the implementation of this project. The project seeks to build on this structure, altering functions and work responsibilities slightly, but still maintaining the same individuals which have coped admirably in the face of adversity.

Roads Branch

The Roads Branch is administratively within the Ministry of Works and Communications; it is responsible for the design, construction, and maintenance of all accepted roads, whether district or national, whether paved, graveled, or earth. It is headed by a senior roads engineer (currently staffed by an ODA operational expert), assisted by three Swazi Engineers (who will remain in the Branch), and a Ugandan engineer (who will be leaving before the commencement of the project). The three Swazi engineers have returned within the past year from AID-financed university training in the U.S. They are professional engineers with grasp and aptitude but limited field experience and insufficient on-the-job training inhibits their managerial assertiveness.

For the past few years, the British government has provided operational experts to the Roads Branch, specifically to staff the senior roads engineer position. Prior to the disaster, ODA had decided not to replace that senior position when it became vacant in October 1984. In view of the rehabilitation effort, however, British authorities have agreed to recruit on an operational expert basis for the position of senior roads engineer and a roads maintenance engineer. With a decision to reconstruct the Big Bend bridge, the British are to provide a third engineer for contract supervision and administration for all roads projects.

The Branch currently has one construction and three regraveling (maintenance) units; these are further disaggregated into 17 work crews, each with a foreman. The nation has four districts, each with a para-professional clerk of the works who have vast practical experience (having risen through the rules), but limited theoretical background. A recently completed two-year course of study (at the

Swaziland College of Technology), sponsored by the World Bank, will provide each crew with an engineering technician skilled in the techniques of quality control and standards/specification inspection and monitoring.

The regraveling and construction units currently work on 50-65 miles of road per year. With increased inspection, supervision, and availability of plant and equipment, the Branch is expecting both to redirect work activities to rehabilitation and to increase road productivity. Currently existing staff will remain in place, but will be bolstered by a greater availability of equipment and the enhanced supervisory experiences of two American engineers, as assisted by their three Swazi engineers counterparts.

Central Transport Administration (CTA)

CTA is a specially funded State organization which is administratively housed within the Ministry of Works and Communications. It is responsible for the procurement, maintenance, and replacement of all GOS plant and equipment. It currently is being evaluated by a West German consulting firm seeking ways and means to improve its operational effectiveness in repairing and maintaining plant and equipment, in tracking the servicing of each vehicle from date of purchase to date of scrapping, in planning for replacement on a scheduled basis, and in billing of (and establishing realistic billing charges to) GOS user departments.

CTA's chief executive is the General Transport Manager; as related to this project, he is assisted by two professionally qualified Swazis, the chief mechanical engineer and the chief accounting officer. These persons have already put into action those preliminary suggestion made by the consultant, thus demonstrating a willingness to change and adaptability to innovative practices.

CTA currently contracts out major work on an exceptions basis, attempting to undertake as much maintenance as possible in-house. The consultant reports that while the calibre and level of experience of technicians and mechanics is high, comparing most favorably with other developing countries, the worker is confronted with a confounding multitude of differing pieces of plant and equipment, not all of which he can be conversant with. As a result, the consultants have suggested more reliance on the specialized skills and major servicing centers of manufacturers authorized representative CTA should concentrate on general preventive and minor maintenance, in which the skills of its employees have a comparative advantage.

This project is compatible with that suggestion; it will contract out work which can not be effectively and timely accomplished by CTA technicians in the field either in the mobile repair vans or stationed at the district departments. CTA field technicians were found to be proficient and knowledgeable about plant and equipment, but not supervised or organized in a manner which would enhance the Road Branches productivity. CTA has fully agreed to second mobile units to be integrated into the rehabilitation units, making the U.S. supervisory engineers responsible for their work assignments. This plus contracting out will allow the mechanics more time to concentrate on routine/minor repairs, replacement of expendable supplies and parts, and preventive maintenance. Once again, the project is designed and anchored on a known quantity of dependable manpower, but redirected and channel into more productive pursuits.

CTA will be involved as pay agent for the maintenance contracts. As a result, we checked into its prompt payment history. All suppliers, except one, indicated a very favorable experience with CTA payments; in most cases, invoices were paid within ten days. Only one supplier mentions a two-year problem with accounts still owed by CTA for partial payments which had been erroneously treated as full payments by CTA. Due to the GOS policy to allow CTA an open warrant, it can expend beyond its normal budget allocation; its revolving fund will eventually be replenished by charges received from departments serviced by CTA. (CTA receives service transfers from Ministries on the basis of fuel charges for equipment and leasing fees for plant. The charges are established to take fuel, repair servicing, and depreciation into account.)

Given the level of professional staff and the experienced non-professional employees of the GOS and the level of British assistance, the administrative structure will be adequate to support this project. The two U.S. provided engineers will provide the additional technical and supervisory skills needed to enhance Swazi talent.

In conclusion, although operationally, as a direct provider of major maintenance services, CTA has been judged to be ineffective. Its secondary functions, as it relates to paying for services rendered, has not been questioned. In this project the deficiency of maintenance will be supplemented by time and materials contracts; given CTA's history we anticipate that contract work order payment will be promptly processed. Thus for the purpose of this project and the limited use of CTA for minor or preventive maintenance and for contract payments, CTA's administrative structure is adequate.

Water Resources Branch

The Water Resources Branch is administratively located within the Ministry of Natural Resources, Land Utilization, and Energy. It is responsible for the measuring and monitoring of river flows in the nation and the apportionment of such surface water to riparians under agreement or permit. It ensures that Swaziland complies with exit water volume to Mozambique and provides hydrological data for water off-take negotiations with South Africa. It collects, analyses, and classifies that data needed for river basin development and water resources management. Since 1953, it has had a network of river gauging stations to provide this information.

It is headed by a chief water engineer, who has served with the Water Branch for seventeen years, he is assisted by a technical staff of hydrologists. The Branch has effectively constructed, repaired, and maintained its gauging network since 1953. It has been expanding this network and improving on the technology of collection and analyses from year to year. In addition to the chief water enginner, the Water Resources Branch has an operational expert hydrologist from AID. That expert will be available during this rehabilitation and reconstruction effort. It possesses work crews to construct new weirs each year and replace/repair existed ones. It staff has competently and adequately assured the functional integrity of strip-graph recorders, telemetry devices, and measuring towers.

Although well-suited to its normal duties and requirements, the Branch's staff can not rapidly reconstruct destroyed or dislocated weirs after Domoina. It can effectively work on only six weirs per year, and then only during the dry months. As a result, the Branch will be exploring the much more expensive proposition of contracting out, utilizing its own engineering construction expertise for contract supervision.

Annex F

ECONOMIC ANALYSIS
SUMMARY

Each of the components of the Rural Reconstruction project is economically viable on its own.

1. While the data is limited, and some of its accuracy is questionable, for a wide range of possible assumptions, the proposed expenditures on road rehabilitation are economically viable. The real internal rate of return for these roads will be in excess of 16%.

2 A better idea of the cost of doing the repair and maintenance of equipment will be known when the tender documents are returned from the bidders. Analysis of time and material repair manuals indicates that performing these functions by private sector contracts rather then by using the Central Transport Administration will be less costly to the Government of Swaziland and result in a larger proportion of the road's branch fleet being operational.

3. The last component of the project is the provision of river gauging stations. The availability of accurate river flow data will result in more accurate apportionment of water use rights. In Swaziland, the returns to small-holder irrigation are sufficiently high to make irrigation a viable alternative to urban migration given the current levels of unemployment. The information on river floica and through Swaziland.

DETAIL
RURAL ROAD RECONSTRUCTION

The University of Natal study of the road network in Swaziland, An Economic Appraisal of Road Projects, 1982, concluded that "The network of main and district roads is remarkably comprehensive for a developing country. It is complemented by a growing system of feeder roads and does not appear to be a bottleneck to economic development; two-thirds of the country is within 8 km of an all-weather road...."

METHODOLOGY

This section will first establish the estimated cost per kilometer for rehabilitating gravel roads damaged by Cyclone Domoina. The next section will analyze the benefits to rehabilitation. It takes the average daily traffic count on these roads times the estimated difference in vehicle operating costs on damaged

gravel roads and on undamaged gravel roads. After determining which of the costs or benefit figures need adjustment to reflect the true economic cost of the resources, an internal rate of return is determined. The IRR is then subjected to sensitivity analysis to determine whether it will hold for a sufficiently wide range of possible assumptions to ensure economic viability of this component of the project.

COSTS

The Ministry of Works and Communication reports yearly on the output of its District Road regraveling units.

WORK OF THE REGRAVELING UNITS OF THE MINISTRY OF WORKS AND COMMUNICATION

fiscal year	# kilometers	Total Cost	Cost per kilometer
1978/79	174	616,000	3,540
1979/80	174	679,000	3,902
1980/81	220	779,000	3,540
1981/82	219.5	675,000	3,276
1982/83	242.3	778,000	4,440

SOURCE: Ministry of Works, Power and Communications, Annual Report 1982 - 1983

In 1978/79 and 1979/80 most of the work was done under contract, in the last few years almost all the work has been done by the Ministry under direct labor. There have been some increases in the cost per kilometer of road regraveling. For the purposes of this analysis we will use the figure for 1982/83, E4440, adjusted for the change in prices between 1982/83 and 1984/85. The Ministry estimates that repair of the gravel/earth roads damaged by the cyclone will be E9000 per kilometer. The economic analysis will use E9000 as its base cost for road regraveling per kilometer. However, this appears high for reasons which will be provided in the following paragraphs. A sensitivity analysis was done on this assumption to discover what effect changing the assumption will have on road regraveling viability.

The true costs of regraveling under the project will be less than forecast by the Roads Branch because of the large percentage of equipment which is currently inoperative. By contracting out major repairs and spare parts the project estimates that 75% of the Roads Branch equipment ought to be usable at all times. The Ministry reports that its plant availability is very low, specifically

PLANT AVAILABILITY AT THE ROAD BRANCH 1982/83

item	percent available
Graders	40%
Loaders	50%
Dozers	80%
Tractors	50%
Rollers	45%
Scrapers	20%

SOURCE: MWPC, Annual Report 1982 - 1983

While the costs of regraveling the cyclone damaged roads will be greater than the regraveling efforts of the recent past, the reduced amount of idle equipment, and therefore people, will be less than was true previously. This will keep the cost per kilometer down.

BENEFITS

Vehicle Operating Costs

One of the economic effects of the cyclone has been to increase the costs of operating a vehicle over gravel roads. The University of Natal's Department of Economics has done a series of reviews of transportation links in Swaziland with a view to recommending which roads ought to be considered for upgrading or construction. The following table gives their estimates of vehicle operating costs (VOC) on gravel roads in Swaziland in 1981. The Government's Central Statistical Office estimates that between October 1981 and June 1984 prices have increased by 30%.7. The estimated costs of operating vehicles in June 1984 was gotten by multiplying the October 1981 estimates by 1.307.

VEHICLE OPERATING COSTS

	Highveld		Middleveld		Lowveld	
	1981	1984	1981	1984	1981	1984
Car	.195	.255	.190	.248	.190	.248
Light Delivery Vehicle	.185	.242	.176	.230	.174	.227
Minibus	.184	.241	.169	.221	.168	.220
Light Vehicles	.188	.246	.182	.238	.181	.237
Bus	.590	.771	.518	.677	.503	.658
8-Ton	.403	.527	.376	.492	.374	.489
3+ axle	.907	1.186	.801	1.047	.784	1.025
Heavy Vehicles	.549	.718	.496	.648	.491	.642

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Since this project will be concentrating on gravel roads which have been damaged by the cyclone, it increased the 1984 figures by 30% to more accurately reflect current vehicle operating costs on cyclone damaged roads. The 30% figure was derived through discussions with public transport operators and officials at the Roads Branch of the Ministry of Works and Communication. The current economic costs of operating a car on cyclone-damaged middleveld gravel roads is estimated to be E0.322.

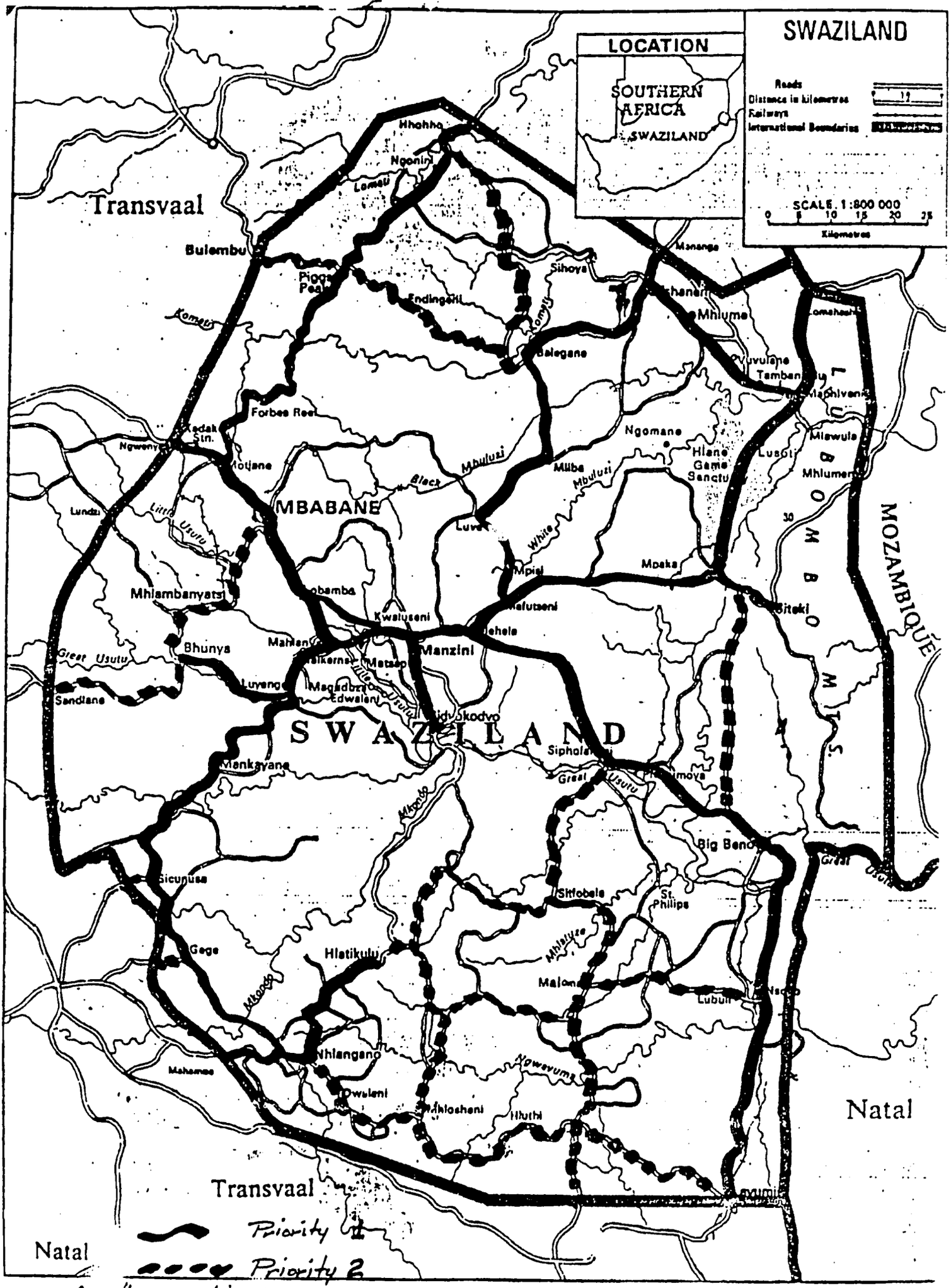
Average Daily Traffic Counts

The Roads Branch has a number of automatic and manual vehicle traffic counters. All the classified district and national roads have been surveyed within the last year. There have not been many counts done since the cyclone. The latest average daily traffic counts (ADT) are provided on the map on the next page. Nearly all classified gravel and earthen roads have ADT's in excess of 100 vehicles per day of which 20% are heavy vehicles. There are only a limited number of roads with significantly fewer light or heavy vehicles.

Adjustments in the Figures

Swaziland is a market economy with very few items protected from market determined prices (those items which are protected do not materially influence this analysis). Unemployment is a growing problem. Analysis done for a recent GOS salary review determined that unskilled and semi-skilled salaries were being forced up by salary increases to government employees. While the government establishes minimum wage scales for a wide variety of industries and skill levels, these are usually ex post wages, established after negotiations between employers and employees. It is probably that the costs of road repair overstate the true economic cost because of the high price of low skilled labor. The importance of this assumption was analyzed through a sensitivity analysis of the costs.

No adjustments were made for overvalued foreign exchange since the Swazi lilangeni is backed 100% and trades at par with the internationally traded South African Rand. Since the end of the financial rand in 1983, the value of the rand has closely approximated its market value. Government of Swaziland budgetary difficulties are getting more severe, but are still not at the level of difficulty which exists in other sub-Saharan African countries. However, because of the difficulty all GOS contributions to this project are inflated by 25% to reflect the opportunity cost of scarce capital.



A. Other proclaimed roads ..... Priority 3

The Internal Rates of Return

The analysis uses the VOCs from the previous table (assuming that the ADT on weekends is only 1/3 that of weekdays). Further the graveling done in this project will, like earlier regraveling efforts, not need to be redone for five years. When the cost per kilometer is E9000 (plus 25% to reflect the tight GOS budget) then the internal rate of return (IRR) is 11.3%. As established earlier it is felt that the cost of low-skilled labor on the road reconstruction teams is in excess of productivity, and that the E9000 figure is probably too high. Thus the true IRR is higher that 11.3%. If the true economic costs are E1000 less than projected then the IRR is 16.0%. It is felt that this is the most likely average real economic return for the economic analysis of the road reconstruction.

Using specific road examples we find that the road near Hluti, in the Shiselweni area, carried prior to the cyclone 150 vehicles per day (25% heavy vehicles). Thus its IRR is 39.9% even with a 25% opportunity cost on the GOS costs.

The road near Herefords in the northern part of the country had 250 vehicles per day, 28% of which were heavy vehicles. This results in an IRR of 103.5%.

While most of the roads scheduled for regraveling have high IRR's that is not true for all possible roads. Some examples of roads whose average daily vehicle use is not sufficient to warrant E9000 per kilometer rehabilitation costs are the road from Lavumisa to Hluti. It carries 83 vehicles per day of which 22% were heavy vehicles. Thus its IRR is 3.5%.

The road from the South African border at Salitje to the Lavumisa-Hluti road has an IRR of 9.6%; the road from Sicunusa to the South African border has a negative IRR. The former road had 120 vehicles per day, but only 3% of them were heavy vehicles. The latter road had an ADT in November 1983 of 68 vehicles or which 26% were heavy. If the cost of rehabilitating these roads can be kept to around E6000 per kilometer then each of these roads will have IRRs in excess of 15%.

The Roads Branch prioritization of the roads needing rehabilitation was done based on the importance to the road network, the average vehicle count and the damage to the road. The priorities run from one (highest) to 12 (lowest), with no road classified lower than 6. The three roads listed in the last two paragraphs, which were no economically viable if the cost per kilometer is E9,000, were categorized as priority five or six for rehabilitation.

SPARE PARTS AND MAINTENANCE BY PRIVATE CONTRACT

METHODOLOGY

This component of the project is analyzed by a cost effectiveness analysis. It is initially established that the existing method of repair and maintenance has not resulted in economic or timely repair of vehicles. It is thus necessary to search for a different way of keeping the Roads Branch equipment operational. Briefly this analysis compares four different alternatives and decides that given the emergency nature of the road rehabilitation, repair by contracting out is likely to be the only viable option.

ROLE OF CTA

The CTA is charged with performing nearly all government of Swaziland purchases of vehicles, repairs and maintenance. Technically it owns the vehicles and charges the user agencies for the purchase and repairs of the equipment by having a surcharge on petrol/diesel. This is supposed to result in an operating profit which is then used to purchase replacement vehicles.

The Technical Section of CTA is charged "to maintain an even flow of work through CTA reflecting a high productivity ration, to an acceptable standard, at minimum cost, that will satisfy CTA customers." The Mechanical Superintendent is "to provide vehicles, plant and equipment to an acceptable standard of technical serviceability, at the most economical cost commensurate with all aspects of safety and the road traffic laws."

PERFORMANCE OF CTA

In the 1982/83 fiscal year CTA was supposed to earn E14.8 million; it actually earned E8.9 million. Part of the reason for the difference is that the down time of the equipment is much greater than projected. Expenditures were approximately what was budgeted, but as the Interim Report (July 1984, by a team of consultants funded by GTZ, the West German assistance agency) on CTA noted "The detailed analysis of the expenditure budget by each head shows variances of over 1000% and CTA was only lucky that the overall expenditure nearly balanced in the end." Revenues were much less than projected. The bottom line is a projected E3.1 million surplus was actually a E2.7 million deficit. In the 1984/85 budget the government is supplementing CTA's budget by E8 million to cover revenue shortfalls which do not cover pairs, maintenance and replacement of vehicles.

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The Interim Report estimated that in 1983/84 the technical sector of CTA ought to have serviced "30,000 mechanically operated units but only 1,500 were actually done; repairs to vehicles and plant estimated to be 15,000 jobs but only 3,000 were done." CTA has no clear plan how to tackle the 700 units awaiting repair how many to recommend for boarding, or how to reduce the backlog, etc.

As of mid-April 1984 the Interim Report estimated that 57% of the CTA controlled fleet was operational.

Further, "because of the backlog of 700 vehicles/plant in the yard and bad experiences of users sending vehicles into CTA's workshops and not having them returned the preventive maintenance scheme has deteriorated to an extremely dangerous level."

"CTA does not inform the users on costs of operation or repairs....CTA is unreliable in giving repair times accurately and vehicles disappear into the scrap yard."

The items in stock bear very little relationship with the numbers carried in the books as being in inventory. The Auditor General compared the items and quantity in stock with actual stock. Only 15% of the items tested were correct.

Meetings between CTA, the government offices which use CTA and consultant team recommended that CTA ought to "increase subcontracts with private sources to reduce quantity of out of service vehicles. At the same time, these private sources can be evaluated for reliability, responsiveness and relative costs."

ALTERNATIVES

The four methods of maintaining Roads Branch equipment are:

(1) continuance of the present method of repair by CTA,

(2) improve the operation of CTA through technical assistance,

(3) have the Roads Branch do the repaid or

(4) contract out the repair to a qualified private sector firm.

COST EFFECTIVENESS

From the foregoing it is concluded that were the Roads Branch equipment used in the reconstruction project maintained at CTA that a high proportion of the equipment would be inoperative for much of

the time. In evaluating the work of the CTA the Roads Branch and the Interim Report felt that the routine maintenance could be effectively performed. However, the amount of time devoted to major overhaul detracts from the time available for regular maintenance. The high proportion of existing equipment which is non-operational indicates that this is not a viable option.

Because of the emergency nature of road repair the second option, improve the operation of CTA, is not within the possible scope of this project. A proposed World Bank project aims to improve the operational efficiency of CTA. If that project is to have a chance of success then it must be able to focus on rebuilding an organizational capability. This project by having major repairs done by an outside contractor gives the Work Bank some breathing time and thus improves the likelihood of its success.

The Roads Branch does not now have the capacity of doing major repairs anything other than very simple repairs. The government is unwilling to establish another group to perform repair functions as it is felt this would lead to duplication of efforts and further reductions in quality. Further, because of the need for rapid rehabilitation of existing equipment and the high cost of establishing a Roads Branch repair facility, this option is not viable in the time span of this project.

Repair by private firm contract is the most economically viable. Since the equipment is not being repaired at present it is difficult to compare current costs with projected private sector repair costs. The repair manuals of the manufacturers indicate that much of the equipment can be economically repaired. The project proposes to hire a contractor to evaluate the current stock and determine which can be economically repaired and which ought to be boarded and replacement vehicles purchased. One of the results of this activity will be save the government money by repairing rather than replacing inoperative equipment.

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RIVER GAUGING EQUIPMENT

METHODOLOGY

This analysis first looks at the reasons why river gauging stations are needed. It then looks at the possible economic justification for each reason.

SUMMARY OF REASONS FOR GAUGING STATIONS

The river gauging equipment is needed for three different, but related purposes. First it is needed to fulfill international water agreements with the government of Mozambique. Second it is to ensure that the appropriate amount of water is diverted to those people who are currently allocated river water use. Lastly, the gauging stations are needed to determine whether additional users of river water can be accommodated.

International Agreements

The international river apportionment agreements must be viewed as part of a package of economic relations between the countries. Swaziland needs the use of Mozambique's rail and port facilities, and Mozambique needs the revenue from the use of these facilities as well as the river water that flows from Swaziland to Mozambique. Without the use of Maputo port or the Mozambique Railroad the transport of Swazi exports to market would be significantly more. While Mozambique would like a greater allocation of river water, and Swaziland would like to be able to send less water to Mozambique, the agreement, when combined with other economic relations, is viewed as sufficiently beneficial to both sides to be continued.

Existing Irrigation Schemes in Swaziland

There has been an expansion in the number of farmers wanting to use river water to irrigate, and those firms/people currently irrigating have been profitable in recent years. Swaziland is a market economy and that land which is under irrigation and individually titled can be sold. Were irrigation not profitable then there would have been property sales and/or decreases in the value of the land. There have been no unusual changes in the hecterage being sold, and property values have continued to climb. Thus, this second use of river water must be viewed as economically viable. (The issue of whether the water charges ought to be increased is separate.)

River Water Apportionment to New Irrigation Schemes

In late 1983 USAID in conjunction with the Ministry of Agriculture and Cooperatives undertook an analysis of the returns to additional small irrigation schemes. This economic analysis uses that analysis extensively.

Methodology

The analytical method used by this analysis was linear programming with a solution derived by the simplex method. The entire model was placed on a computer. This permitted an analysis of the impact of each of the assumptions, and an investigation of different approaches to irrigated farming in Swaziland. The objective function was the expected net return from irrigated output per hectare of different summer and winter vegetables. Costs included seeds, fertilizers, chemicals, tractors and packaging. The cost of equipment and seasonal loans and the operation/maintenance of the irrigation system were treated separately. Labor time included the estimated number of work days needed to prepare the ground, establish the seedbed, transplant/plant, fertilize, weed, irrigate, spray and pick the crop. The figures were derived from work done at the Malkerns Research Station by the USAID funded Cropping Systems Project.

Production per hectare was derived by taking the average between current production on RDA land and the Malkerns estimated potential on SNL. Prices were assumed to be basically the lowest of the average prices in the Swazi, Johannesburg or Durban wholes were marketed, 80% of all other crops except for cotton where all production was marketed. The balance is either wasted or consumed by the homestead.

The approach taken by this analysis of the financial return to small scale irrigation on Swazi Nation Land is to assume as little change in production methodologies as is possible. This means that the Swazi farmer who begins farming on an irrigated plot will not be able or willing to use the latest techniques, hire as much labor or borrow as much cash as would optimize profit. The farmer will thus not get the optimal amount of output from the fertilizers, improved seeds or technological inputs. This analysis assumed that the farmers are more likely to grow products they can use and less likely to grow potentially high profit items which can only be sold (for example growing flowers or limited demand vegetables). This analysis assumed the farmer does not fully understand the operation of the market and thus will plant at the same time as most other people plant. Thus, the farmer's output will reach the market when the market is most likely to be saturated, and price is relatively low.

All of the assumptions used thus decrease the likely returns to irrigated farming. Rather than make overly optimistic projections of what is possible on SNL this analysis preferred to err on the "reduced returns" side and determine whether, even with relatively negative assumptions, the farmers are still likely to make enough money in the early years of irrigation to sustain interest. After these years, the better farmers will discover the advantages of producing crops at either the technically wrong time of the year or when land preparation is more difficult and of growing items that the market values highly, even if the farmer would not purchase them.

Constraints

Three general constraints were used when finding the linear programming solution:

(1) the amount of land cultivated,

(2) the amount of labor available and

(3) the amount of cash available to purchase inputs.

Since two irrigated crops per year are possible, each of these constraints were further divided into summer and winter situations. Three additional constraints were that no more than four different crops could be planted in any one season, that in the winter the farmer would want at least one fourth of an irrigated hectare planted in maize and that certain crops could technically be grown only during certain seasons.

The farmer will want to reduce risk by not planting only one item. However the knowledge about input needs and cultivation techniques of different crops ought to be kept to a minimum to reduce the learning required thus increasing the likelihood of success.

The justification for the second constraint is that the Swazi homestead usually has around 9 people. Each person consumes on average, according to the FAO, 250 kg. of maize per year, or 4.5 tons per homestead. (In recent years the average value of total SNL and title deed maize production in Swaziland plus maize imports, divided by population has been 250 kg.) In the summer the homestead grows rain-fed maize which supplies at least 80% of the homestead's needs. Thus, the homestead will be short around one ton of its maize needs. Currently this is purchased commercially or from neighboring farmers by those homesteads with some person in wage employment.

Production

On RDA non-irrigated land maize production averaged 1.3 tons per hectare in the last three years. The Malkerns Research Station estimates that production ought to be at least 5-7 tons (and higher with correct inputs and timing). If agricultural production is improved to at least half way between the Malkerns defined good potential and current RDA actual production, then one irrigated hectare ought to produce 3-4 tons of maize. One fourth of a hectare will produce just about the amount of maize the homestead needs. (The benefits from irrigated land are more likely to be controlled by an individual than is the case with rain-fed land. Thus, the demands on irrigated land to make up the entire shortfall for the community or extended family will be mitigated somewhat.)

The crops included in the analysis were those viewed as technically feasible by the Malkerns Research Station. In determining the returns to production of each crop this analysis used for output estimates one half the difference between current production and the Malkerns estimate of good production. In the case of cabbage production the difference is slight 10,000 kg now, and 12,000 kg. as a likely target. However, in the case of tomatoes it is much greater 5 tons now with good potential being 15 tons. The analysis assumed the farmer markets the crop at the worst possible time following harvest. Thus the lowest price for the three months around the anticipated harvest date was used. The Swaziland farm gate price was used whenever it was lower than both the the Johannesburg and Durban wholesale prices. When either of the South African prices was lower, then increased Swazi production ought to result in lowering the Swazi price to the South African level. It is unlikely to go much below the South African prices as the IFAD Credit and Marketing Project (they are constructing a Central Wholesale Market for Swaziland) expects to assist in exporting the surplus (mainly to South Africa). Thus, when South African prices are less than Swazi prices the analysis assumes a fall in Swazi prices to roughly the South African level. (All prices used in this analysis are from the MOAC Agricultural Marketing Service.)

One additional assumption on output was that no more than 80% of the output will actually be marketed. This allows for both home consumption of produce and for some spoilage. In the case of winter grain maize it was assumed that all output was consumed at home. For sweet potatoes, onions, groundnuts and cabbages it was assumed that one fourth the output will be consumed by the homesteads. All cotton input per crop per hectare was gotten from work done by the USAID assisted Cropping Systems Project. Their figures differ from

estimated input needs derived for the IFAD project and with estimates in the Crop Profitability Guide of the MOAC. Since the Malkerns figures were the most complete and involved the least patching of data from different sources it was used for this analysis. While the actual figures might not be exact, the input/output relationships between different crops appeared to be correct. As Malkerns' field data improves this financial analysis can be improved. The team implementing the project will have the benefit of more accurate figures.

Linear Programming Solutions

The results are given for farms in the middleveld. The returns to farms in the lowveld are approximately the same. Where they differ by more than 5% the lowveld results are also given.

In the basic results for the middleveld we assume that the irrigated plot is one hectare, with 10% being fallow at any point. The farmer has 90 person days of labor available in the summer and 120 in the winter. In the summer some labor time is devoted to rain-fed agriculture. There is E300 available in each season to purchase agricultural inputs. The crops considered for inclusion in the production package include beans (dry and green), mixed vegetables, groundnuts, cabbages, carrots, groundnuts, tomatoes, maize (green and grain), onions (winter only), Irish potatoes and sweet potatoes. The production package that optimizes profit has the farmer growing in the winter 0.55 ha of beans and 0.25 ha of maize. In the summer the production is 0.46 ha of carrots and 0.12 ha of tomatoes. The resulting cash income (subtracting purchased inputs) is E965. [In the lowveld the production will be .44 ha of beans and 0.32 ha of cotton in the summer with 0.55 ha of beans and 0.25 ha of maize in the winter for a return of E976.]

The linear programming solution maximizes the objective function, cash income, subject to a number of constraints. In doing this, a frequent result is that some of the constraints are not effective. In this case there is a surplus of land in the summer. This exists because of a lack of labor to work the land and cash to purchase needed inputs. This is true to a lesser extent in the winter.

The dual solution in a linear programming problem gives the increase in profit resulting from changes in the constraints. An additional day of summer labor increases profit by E1.78. Since the cost of agricultural labor is under L1.00 per day it would be profitable to hire additional labor. Hiring an additional labor day

increases profit by 78c. If the money is borrowed for 9 months from the Swazi Bank, using the small holder seasonal loan scheme, then interest payments will reduce profit to 68c. [In the lowveld the returns to additional summer labor is L0.95; thus hiring additional labor is only marginally profitable at best. It is not economic to borrow the money to hire the additional labor.]

The Swazi Bank charges 7.5% interest on small holder agricultural loans of under E1000. Each additional lilangeni of cash in the summer increases profit by E1.29 and thus it would be wise for the farmer to borrow. [In the lowveld the returns to additional capital for inputs and materials are more profitable. Each additional lilangeni increases summer profits by E1.58 and winter profits by E2.42. In other words, lowveld farmers need more capital than middleveld farmers.]

As mentioned at the beginning these results are assuming exceptionally conservative farming practices, little innovation, that the farmer is unable to produce any more than one half the projected benefits from irrigation, and that the farmer sells the output at the time when the prices in the markets are at their lowest. Even with these assumptions small scale irrigation will yield sufficient returns to cover all expenses with something left over.

The median net return per labor day (per year profit less the cost of repaying loans and operation/maintenance of the irrigation system, but adding the value of non-marketed output) works out to be E4.12. If this is the only source of income then the median return is E2.45 per day for a full work year. The 1981 Employment and Wages review noted that the average earning in the private sector for unskilled labor was E4.06. We need to discount the average earnings in the private sector by the likelihood of being employed and subtract the increased cost of living in the urban areas when compared to the rural areas and then inflate by 18.2% to reflect inflation between June 1981 and January 1983. The result, E2.70, is just above the estimated per year return to irrigated farming when irrigated farming is the only source of cash income. With a lessening of the gap between the returns to remaining on the land and migrating to the cities is lessened and thus there is a likelihood of reduced migration.

FINANCIAL AND BUDGET ANALYSES
SUMMARY

FINANCIAL ANALYSIS

The analysis concludes that the GOS has adequate budgetary resources to finance the project. Most of the GOS commitment of $2,858 includes funds which are already available in the recurrent budget or capital budget. The four rehabilitation units each have their own budget account and proper procedures are established to fully account for all GOS expenditures.

The Roads Branch of the MWC and the Water Resources Branch of the MNRLUE have consistently performed better than most other government offices in establishing sound budgeting and fiscal controls. Also, the Roads Branch and the Water Resources Branch established their priorities following the cyclone and the project responds directly to those priorities. Since infrastructure reconstruction is the major priority of the GOS, adequate funds have already been committed for the operational expenses of the roads reconstruction effort.

The Rural Reconstruction Project is not directly revenue producing. It will have an indirect impact on the government's earnings from taxes. From the standpoint of the beneficiaries it lowers their vehicle operating costs, or permits the expanded use of river water in irrigation. Both of these will have positive effects on the beneficiaries' net discretionary income. Analyzed differently, the GOS, by placing very high priority on infrastructure rehabilitation has demonstrated that it feels the economic health of the kingdom depends on the repair of the damage caused by the cyclone.

The branch of government which has not had adequate fiscal control, and has been unable to live within its projected budget is the Central Transport Administration. It has required substantial GOS budgetary support. A recent review noted "The Central Transport Administration lacks nearly totally an interactive transport-industry oriented control system...input/output control of fleet, machinery and plant have deteriorated to such an extent that no meaningful data and information can be extracted...to arrive at data which is essential to efficient transport operation."

This project, by having the major repairs of Roads Branch equipment done by private contractors, follows one of the suggestions in the Report of a German consulting team. CTA has capability to adequately keep the books, co-certify that repairs are needed and that they were performed.

PART I

A: OVERALL BUDGETARY PROBLEMS IN SWAZILAND

Swaziland is going through a difficult economic period. At present the effects of the world recession are still being felt and all the major exporting industries are having problems selling their output because of reduced demand world-wide and in South Africa. Damage to road and bridge infrastructure caused by the cyclone which struck the country in late January 1984 will make large demands on the government capital budget and force large-scale rearrangements of spending. The government has the revenue to pay for much of the reconstruction efforts from current revenue. It will still have to substantially increase its debt. By international standards the government is underborrowed, it has a sufficiently high credit rating that borrowing for reconstruction should not pose any major problems.

The Swazi government's fiscal year begins April 1. Table 1 presents information on actual revenue and expenditures for the period beginning with the Third Plan (1978/79) and including the proposed 1984/85 budget.

TABLE 1
REVENUE AND EXPENDITURES FOR GOVERNMENT OF SWAZILAND
1979/80 - 1983/84
in millions of emalangeni

item	1979/80	1980/1	1981/2	1982/3	1983/4 revised budget	1984/5 budget
REVENUE						
Company tax	17.8	15.7	18.0	18.4	27.0	20.7
Tax on Individual	12.2	17.1	20.1	20.2	21.6	25.3
Customs Unions	74.2	86.8	62.7	117.6	120.7	130.4
Sugar Levy	7.9	13.4	12.3	1.4	0.0	0.0
Sales Tax						10.0
other	14.1	20.9	16.7	19.1	20.7	21.4
TOTAL REVENUE	126.2	153.9	129.8	176.7	190.0	207.8
grants	7.2	9.4	4.4	5.4	5.1	6.4
REVENUE PLUS GRANTS	133.4	166.3	134.2	182.1	195.1	214.2
SPENDING						
Recurrent spending	65.3	84.5	109.1	124.0	135.5	144.9
(personnel)	(34.9)	(45.9)	(59.2)	(66.6)	(74.8)	(85.2)
Capital spending	65.9	57.7	73.1	72.4	72.6	71.8
TOTAL SPENDING	131.2	142.2	182.2	196.4	208.1	216.7
BALANCE	2.2	24.1	-48.0	-14.3	-13.0	-2.5

Source: Government of Swaziland, Ministry of Finance

Swaziland's budgetary position has remained fairly stable during the past few years. Revenue has been greater than recurrent spending every year. Thus, the government has been able to partly finance the capital budget itself. The table shows a much greater GOS contribution to the capital budget than is actually true. The budget only includes those donor funds which go through the GOS treasury. Grants/Loans which do not go through the Treasury are not included. Thus, total capital spending in Swaziland is greater than the GOS budget indicates. For example, in the 1984/85 budget total capital spending is estimated to be E77.6 million, of which only 79% will go through the budget.

In both 1979/80 and 1980/81 outside assistance resulted in overall budgetary surpluses. External borrowing by the Government has exceeded financing requirements in several years, and the Government has been able to remain a net creditor with respect to the domestic banks.

In 1981/82 the Government experienced a sizeable overall budget deficit equal to 8% of GDP. This deficit was essentially caused by a sharp decline in revenue (related to the customs union) and an increase in expenditures associated with King Sobhuza II's Diamond Jubilee. The deficit necessitated a substantial reduction in the Government's bank deposits.

During the period from 1979/80 to 1983/84 revenues have grown by slightly less than the inflation rate. Prices increased on average by 13.4% per year. Thus, there has been a slight negative real growth in revenue, a large reduction in real capital spending and a real increase in recurrent spending, especially spending on personnel. The negative growth in capital spending is partly because of implementation difficulties and the completion of large capital projects in 1978/79. The IMF noted in 1980:

> "The accelerated pace of public investment spending, particularly in 1978/79, brought to the surface a number of weaknesses in budget formulation, execution, and control, due largely to a shortage of trained manpower. Fiscal discipline was also being threatened by the growth of expenditure commitments not subject to budgetary scrutiny, especially those arising from the provision of government guarantees to enterprises outside the effective control of the Government."

The 1981 Report by the Auditor General for the financial year ending 31 March 1981 noted continued "omissions, misposting and failure to make proper bank reconciliation, balancing of cash books and general check up of liabilities, assets, deposits and capital

accounts." The report provides examples of overbillings, excessive cost overruns, fraud and questionable expenditures. In the 1984/85 Budget Speech the Minister of Finance said "I am determined that during my tenure of office, a proper and efficient system of financial management and control will be reestablished...Any principal secretary failing to observe the correct procedures for control of funds...will be considered for surcharge under the Financial Act." [The Financial Act permits the Minister of Finance to charge the Principal Secretary for overspending.]

The situation has been exacerbated by fluctuating Customs Union receipts. The year-to-year growth rate since 1979/80 has been +17.0%, -27.8%, +87.6%, +2.7% and 8.0%. The level of Customs Union receipts is known in advance but the GOS has been unable to adjust spending or other taxes to accommodate changing receipts. In the past the Government has had ample funds in reserve to handle the fluctuating receipts.

Personnel expenditures have taken just over half the total recurrent spending since 1979/80. The increase in the debt outstanding is reflected in public debt service payments which amounted to 2.1% of the 1978/9 recurrent budget and grew to 10.7% of the revised estimate of 1984/5 recurrent spending.

In the last three years only receipts from the Customs Union have increased. Collections from all other major taxes have dropped or been stagnant. Had it not been for the large increases in Customs Union receipts, the deficits would have been unmanageable. The GOS drew down on its bank deposits to fund recent deficits. The government had a net creditor position with the economy of E44.4 million in March 1978. This rose to E65.7 million in March 1980 but has since fallen to E14.6 million in December 1983.

The government no longer has the cash reserves to fund large deficits, and must borrow to meet its capital requirements in excess of recurrent revenue. Total external public and publicly guaranteed debt stood at E99.4 million at the end of March 1979. By the end of the Third Plan in March 1983 it had risen to E187.5 million. Much of the increase in the debt was caused by borrowings for the Third Sugar Mill (Simunye) and the southern rail link. The debt is increasingly owed to international organizations at harder terms than bilateral loans which usually have concessional elements.

Only E16.6 million of the currently outstanding debt was borrowed at commercial rates from commercial banks. The balance is owed to international organizations (mainly the World Bank and African Development Bank/Fund) or to foreign governments (mainly the UK and West Germany). Twenty-nine percent of the debt is owed by public enterprises and as such will only involve a burden on the government if those enterprises are unable to meet their commitments.

The overall debt situation in the country is very good, especially when compared to other countries. The trend indicates, however, that possible difficulties are developing. While the current ratio of debt service payments to exports is still very low, just over 6.5%, it was only 2.2% at the beginning of the Third Plan. In 1980, the debt service ratio for all sub-Saharan countries averaged 28.3%, and for all middle income countries it averaged 20.7%. Similarly debt servicing took 2.1% of total government recurrent spending at the beginning of the 3rd Plan period, but 10.7% of total estimated recurrent spending in the 1984/85 budget. Debt is now 29.8% of GDP, compared to 15.6% at the beginning of the 3rd Plan period. In 1981 countries with a per capita income comparable to Swaziland's had an external debt that was 36.3% of GNP.

B.FUTURE PROJECTIONS

For the next five year (1984-1989), the government has projected receipts and expenditures as:

TABLE 2
REVENUE AND EXPENDITURE FORECASTS FOR GOVERNMENT OF SWAZILAND
1985/86 - 1989/90*
in millions of current emalangeni

	1985/6	1986/7	1987/8	1988/9	1989/90
REVENUE					
Individual and Company Tax	55.3	59.2	64.5	69.9	76.0
Customs Union	134.7	151.6	170.0	182.9	204.8
Sales Tax **	11.1	11.9	13.2	14.4	15.9
Other	43.4	46.6	51.6	56.6	62.5
TOTAL REVENUE	224.4	269.3	299.2	323.8	359.2
SPENDING					
Recurrent spending	157.8	172.1	187.5	204.8	222.5
Capital Spending	98.5	110.0	125.4	133.7	152.4
TOTAL SPENDING	256.3	282.1	312.8	338.5	374.8
DEFICIT	-11.9	-12.8	-13.7	-14.6	-15.7

*Estimated by the GOS/USAID Econometric Forecasting Model.
**The final form of the sales tax has yet to be determined. If the current proposed form is implemented then it ought to collect up to E4 million more each year.

Originally the model was run without constraining the magnitude of the deficits. However, that showed deficits would be growing to levels which the government felt were dangerous. The decision was made that the annual deficits could not be greater than E10 million in 1983 emalangeni. Capital spending was restrained to reduce the deficit.

Inflation in Swaziland depends on inflation in South Africa. The resulting derived inflation is expected to average around 9.8% per year. Real economic growth is estimated to be no more than 2.3% per year during the 1984 to 1989 period. This implies that real per capita income will fall by 1.1% per year. Sugar prices are not expected to rise above the threshold price where the sugar levy begins to collect revenue. Easing the situation somewhat is the proposed sales tax. The Government estimates that this tax will collect E10 million in its first full year of operation, however, since the scope of the tax has not yet been determined, and the people who will have to administer it have not been trained, it is unlikely that it will be operational in the 1984/85 fiscal year. Until the exact definition of the tax is known it is difficult to estimate its revenue impact.

[Since the model was estimated the Economic Research Unit at Stellenbosch University in South Africa has increased its estimate of South African inflation to an average of 13.7% per year, this implies a 14.1% rate in Swaziland. South African real growth rates will also be less than originally forecast. This ought to slow Swaziland's real growth rate by 0.2 to 0.3 percentage points per year.]

There are still deficits projected during the 1984-1989 period. Lacking a substantial cash reserve, the government will have to engage in extensive deficit financing. Total estimated external public and publicly guaranteed debt stood at E187.5 million at the end of March 1983. If the above deficits are financed through borrowing, then the debt will increase by one-third during the next five years. Unless concessional grants and soft loans are procured, the commercial financing of this debt will further increase the anticipated deficits. At present the estimated cost of servicing the debt (10% interest, three years grace period with automatic rollover of debt) is projected to mount to 11.6% of total recurrent spending by 1989/90. If the terms of borrowing are harder, then spending will have to be further restricted.

The proposed levels of spending and the resultant increase in debt are justified if there are projects which are economically

viable and which yield long term benefits to the nation. However, most of the recent increases in spending has been on debt service payments and recurrent personnel costs. Much of the increase in debt in the last few years has taken place to pay operating costs of the Government. Additional increases in debt for non-long term capital projects could lead to debt-servicing problems. The Government's internal analysis of the financial implications and economic viability of capital spending is weak. Usually if a donor is willing to pay (or provide loan funds) for a sizable portion of a project, then it will be included in the budget.

While the budgetary difficulties of the Government of Swaziland are considerable and projected to get worse in the coming years, they are not of the magnitude of many other countries. The current low level of public and publicly guaranteed debt gives the Government a little time to control spending or impose new taxes. Improved fiscal control and reduced deficits are necessary if the Government is to avoid increasingly difficult dilemmas in the future. The former Minister of Finance emphasized the need to eliminate recurrent budget overspending, improve accountability, and ensure that the Government's money is spent more intelligently than was true in the past. One method which the government has used in the past to control over-spending has been to refuse to release order books to government offices. Without these books government offices cannot order items or spend money. While this will reduce the deficit, it also results in keeping people on the payroll but not giving them materials to work with, or work to do. This has also contributed to the failure to spend money on capital programs.

Unless expenditure controls succeed or the government imposes new taxes, the GOS will only be able to meet new recurrent spending by cutting existing recurrent spending; capital spending will have to be drastically curtailed. Funding difficulties have already forced the GOS to meet only ongoing capital commitments, with very few new starts in both 1983/84 and 1984/85. Without additional revenues, or improved management of existing spending, the partial freeze on hiring additional staff and on initiating new capital projects will probably have to continue for the rest of the decade.

PART II

A: CAPITAL BUDGET

Taking the projections for capital spending contained in the Third Five Year Plan and inflating them to reflect inflation allows a comparison of the spending which was projected by the Plan, with budgeted and actual spending. Table 3 provides details on the actual capital spending made by the GOS since the beginning of the Third Plan in 1978/79.

TABLE 3
GOS CAPITAL BUDGET ACTUAL SPENDING
in millions of current year emalangeni

	1978/9	1979/80	1980/1	1981/2	1982/3	1983/4	1984/5
GENERAL SERVICES							
general administration	10.7	2.2	2.0	4.0	4.7	4.4	5.9
law and order	1.9	1.8	1.5	2.2	3.1	2.5	5.8
SOCIAL SERVICES							
education and training	6.4	6.1	9.8	14.6	7.2	7.5	12.0
health	1.1	.8	1.3	1.0	1.8	1.4	6.2
housing	1.2	.2	1.2	1.8	1.7	.5	.5
other community services	2.1	2.0	3.8	6.2	4.4	1.3	2.8
ECONOMIC SERVICES							
agriculture	17.4	14.7	10.1	11.6	14.1	7.5	4.0
industry and mining	3.2	2.7	2.4	1.9	.2	2.6	.0
water and sewerage	.4	1.3	1.7	1.8	1.5	3.1	2.1
transport and communication	8.5	12.8	11.5	16.4	19.0	28.8	23.9
other economic services	.8	.1	.0	.3	.0	.0	.1
TOTAL	53.6	44.7	45.3	61.8	57.7	59.6	63.3

SOURCE: GOS Ministry of Finance, 1984

The Third Plan projected that the dominant user of capital funds was projected to be industry and mining; the budget did not reflect this priority. Capital spending on transport and communication has been on additional roads, improvements at the airport, and additional telecommunications equipment. Education has become the second largest user of capital funds. This is partly because of the need to spend the balance in the World Bank's Third Education Loan. This will increase GOS supporting expenditures. Agriculture, which had been the second largest user of capital funds (purchasing equipment for the RDAs), is scheduled to be a minor user of capital funds this year.

Tables 4 and 5 show how planned and budgeted allocations compare with actual spending.

TABLE 4
RATIO OF ACTUAL CAPITAL SPENDING AND PLANNED CAPITAL SPENDING

	78/9	79/80	80/1	81/2	82/3
GENERAL SERVICES					
general administration	.58	.49	.34	.58	.63
law and order	.39	.26	.23	.37	.43
SOCIAL SERVICES					
education and training	.55	.41	.64	.86	.40
health	.33	.38	.59	.50	.75
housing	.75	.06	.18	.32	.27
other community services	.52	.53	.88	1.55	1.13
ECONOMIC SERVICES					
agriculture	.70	.52	.83	.76	.78
industry and mining	.12	.09	.09	.08	.01
water and sewerage	.18	.56	.44	.44	.39
transport and comm.	.22	.78	.84	.83	.66
other economic serv.	.80	.17	-	1.00	-
TOTAL	.80	.17	.46	.60	.52

A dash indicates no spending was planned.
NB: a number greater than 1.00 indicates that actual spending was greater than planned spending.

TABLE 5
RATIO OF ACTUAL CAPITAL SPENDING AND BUDGETED CAPITAL SPENDING

	78/9	79/80	80/1	81/2	82/3	83/4
GENERAL SERVICES						
general administration	.72	.65	.44	.91	1.27	.88
law and order	.42	.34	.36	.30	.52	.49
SOCIAL SERVICES						
education and training	.74	.45	.64	.94	.85	.84
health	.55	.29	.21	.36	.54	.74
housing	1.00	.11	.39	.67	1.06	.24
other comm. services	.88	.41	.88	.75	.96	2.00
ECONOMIC SERVICES						
agriculture	.79	.58	.63	.75	.93	.76
industry and mining	.18	.13	.07	.18	.04	.79
water and sewerage	.44	.56	.42	.40	.47	1.00
transport & communic.	.26	.63	.36	.56	.49	1.04
other economic serv.	.89	-	-	1.00	-	-
TOTAL	.50	.44	.37	.61	.64	.88

A dash indicates no spending was planned.
NB: a number greater than 1.00 indicates that actual spending was in excess of budgeted spending.

Overall, of the E564 million that was planned for capital spending during the Third Plan (78/9-82/3), only E522 million was actually budgeted. E263 million (47% of the planned spending) was actually spent. Since spending was always so much less than the amount budgeted the Government in the 1983/84 budget reduced the capital budget to make it more closely approximate probable spending. Thus in 1983/84 88% of budgeted spending was actually spent whereas in the earlier years never more than 2/3 of the capital budget was actually spent. Further, the spending by all the major functional categories of the budget more closely approximated the budget than was true previously. However, as the table shows, the performance by functional group was still uneven. This inability to meet planned spending was discussed briefly earlier. The table shows there is very little correlation between planned, budgeted and actual spending figures. There are no consistent patterns as to which functions are better at meeting the original plan or utilizing their budgetary allocations. The decisions on capital spending priorities which were contained in the Third Plan were not implemented through the annual budgetary process, and the annual budget's priorities are not reflected in the actual spending which takes place.

Making the results worse, many of the projects which were budgeted and implemented were not part of the Third Plan. That is, a donor proposed a project not contained in the Plan and the government decided that it ought to be implemented rather than those projects already approved but for which funding was not secured. The actual spending pattern does not reflect Third Plan preferences, or GOS preferences as reflected in the annual budget. In short, the Plan was not a guide to action. However, neither does the annual budget give much guidance as to which projects will be implemented during the year. The last year for which there is an accepted audited report is 1979/80. While nothing appeared in the original 1979/80 budget for contributions to the Royal Swazi National Airline, the shipping company or the Lavumisa rail link, a total of E17.4 million was actually spent. A large number of other projects had their spending either delayed or reduced to accommodate these unplanned costs. This pattern continues to the present.

B: RECURRENT BUDGET

The situation with the recurrent budget is no better. Table 6 give the breakdown on expenditures using the IMF classification scheme.

TABLE 6
FUNCTIONAL CLASSIFICATION OF ACTUAL RECURRENT EXPENDITURES
millions of emalangeni
GOS fiscal year

	77/8	78/9	79/80	80/1	81/2	82/3	83/4	84/5 budget
GENERAL SERVICES	16.1	15.4	17.7	22.4	33.1	31.1	33.5	41.9
General Admin	10.5	8.1	10.1	13.2	21.4	17.1	18.5	24.9
Pub. Order/Safety	5.6	7.3	7.6	9.2	11.7	14.0	15.0	17.0
DEFENCE	3.7	7.3	8.2	8.5	10.3	12.9	14.3	11.6
SOCIAL SERVICES	18.0	24.7	23.7	34.9	42.3	48.0	54.1	54.6
Education	11.6	14.8	14.9	22.2	25.7	29.8	33.9	34.3
Health	4.2	4.7	5.3	7.1	8.2	11.6	13.5	12.6
other	2.2	5.2	3.5	5.6	8.4	6.6	6.7	7.7
ECONOMIC SERVICES	10.4	9.7	11.4	14.2	17.6	24.1	23.7	26.2
Agriculture	3.9	5.2	6.2	7.8	9.2	10.8	11.4	12.6
Industry/Mining	1.1	1.0	1.0	1.4	1.4	1.7	1.4	1.8
Water/Sewer	2.1	.2	.2	.4	.4	.5	.7	.9
Roads	2.8	2.9	3.5	4.0	6.0	9.8	9.3	9.8
Other	.6	.4	.5	.6	.6	1.3	.9	1.1
PUBLIC DEBT	.4	2.1	4.2	4.6	5.8	7.9	9.9	10.7
TOTAL	48.5	59.2	65.3	84.5	109.1	124.0	135.5	144.9

SOURCE: Government of Swaziland, Ministry of Finance, 1984

Consistently the largest user of recurrent funds is education with the general administration of the Government a distant second. The proportion of the total recurrent budget being spent on each functional grouping has been very constant from year to year. Agriculture consistently has been spending 9% of the recurrent

budget; education has varied between 23% and 26%. The only entry which has increased its proportion tremendously is the servicing of the debt: it spent 1% of the budget in 1976/77, but is estimated to take 7% of the recurrent budget in 1984/85. While defence has increased its spending from 5% to 8% between 1976/77 and the present, this hides a drop since 1979/80 when defence spent 13% of the recurrent budget.

Part of the reason for this consistency is that the budget is frequently drafted as adding the same percentage to all categories. Actual spending as a percentage of budgeted amounts is presented in Table 7.

TABLE 7
GOVERNMENT OF SWAZILAND
RECURRENT BUDGET
ACTUAL SPENDING AS PERCENT OF AMOUNT BUDGETED

	77/8	78/9	79/80	80/1	81/2	82/3	83/4
GENERAL SERVICES	29%	-25%	0%	4%	27%	7%	10%
General Admin.	45%	-43%	-3%	6%	40%	2%	5%
Pub. Order/Safety	6%	16%	4%	1%	9%	14%	16%
DEFENCE	131	60%	61%	35%	7%	8%	29%
SOCIAL SERVICES	23%	28%	4%	19%	15%	19%	19%
Education	32%	34%	2%	15%	19%	22%	20%
Health	11%	-1%	-7%	2%	-6%	18%	30%
other	7%	49%	38%	80%	27%	6%	-1%
ECONOMIC SERVICES	12%	-18%	-13%	-9%	-3%	32%	9%
Agriculture	5%	-2%	-1%	1%	3%	11%	10%
Industry/Mining	78%	25%	32%	79%	8%	21%	-3%
Water/Sewer	[	]	-89%	-81%	-20%	-17%	-1%
Roads	[18%	-40%]	-3%	-11%	-9%	72%	13%
Other	[	]	-30%	-2%	25%	44%	0%
PUBLIC DEBT	-88%	176%	-11%	-37%	32%	-5%	10%
TOTAL	17%	4%	3%	6%	15%	15%	15%

Education has consistently overspent its budget, and since 1979/80 it is increasingly overspending each year. Since education is the largest single functional classification, a 20% overspending in 1983/84 translates to E5.6 million. In other words, 4.1% of the total GOS recurrent budget spending in 1983/84 was budget overruns in education. Of the major functional categories, roads has done

the best job in developing a budget which is accurate. The underspending has usually resulted from underbilling by the Central Transport Administration which repairs Roads equipment and whose charges have not been reflecting true costs.

A study by the World Bank on recurrent spending in low income countries estimated that Swaziland was spending 1.9% of its GDP on agriculture while the mean for the 27 countries surveyed was Ø.9%. Similarly with education Swaziland was spending 3.8% while this group of countries spent 2.7%. Swaziland spends a greater proportion of its budget on roads than the median of other middle-income oil importing sub-Saharan countries.

The problems of CTA cannot be glossed over. It has had difficulties in overhauling vehicles, performing routine maintenance, keeping sufficient vehicles operational and in charging Ministries. It has operated on an open trading account which means that it is permitted to contract for parts and maintenance from outside as needed in order to keep the government's fleet operational. In essence this is a blank check to incur whatever expenses are necessary. It is supposed to receive the funds to finance its activities by charging the government users one lilangeni per liter ($Ø.62 at the current exchange rate). The pump price is EØ.63 per liter. This extra charge is to pay for maintenance.

The effect of this system is that those government offices which take care of their equipment and thus they do not need any major repairs are subsidizing those other offices which abuse their equipment, or do not perform the appropriate daily maintenance. If equipment is not working, then CTA is not taking in any money. Thus, the longer equipment is out of operation, the greater will be the deficit at CTA.

For this project CTA's field representatives with the Roads Branch regraveling units will co-certify with the supervisory engineer that equipment needs repairs and the repairs cannot be done by CTA. The equipment is then sent directly to the repair facilities, with CTA issuing the necessary documents. The supervisory engineer and the CTA field representative will then certify that the work was correctly performed. CTA will then pay the bill of the repair contractor and every quarter bill USAID for USAID's share of the repair work. The USAID/S Controller has met with the CTA financial officer and explained the reporting requirements. It is his professional judgment that CTA will be able to perform this function adequately.

Detail on the problems of budgeting at CTA are included in the economic analysis as part of the economic justification for the procedures being used in this project.

BUDGET ANALYSIS

A. BUDGETARY ASSUMPTIONS

In order to facilitate use and understanding of the budget for this project, this annex provides information on the assumptions that went into the computation of each figure. Explanations for the rationale for each assumptions is provided in the appropriate section of this annex.

1. General

a. Because this is a two year project and much of the equipment being purchased will be ordered almost immediately, inflation estimates were only necessary for next year. All U.S. costs subject to escalation are inflated by 6% and all Swazi costs are inflated by 14% in 1985/86. This inflation does not apply to long term technical assistance where fixed two year contracts are to be used.

b. No contingency factor is used. For many of the items in this project USAID is supplementing GOS activities and monies. When the USAID funds are exhausted then the GOS will fund that component entirely. The USAID funds will be completely obligated in FY84 but will be used over the life of the project and pro rated such that USAID has have a continued input into each of the items.

c. The exchange rate between the emalangeni (traded at par with the South African Rand) and the dollar has been exceptionally volatile recently. At the time of the PID the exchange rate was $1.00=E1.38 (June 29, 1984). Currently the rate is $1.00=E1.62 (August 1, 1984). Consequently any conversion from emalangeni to dollars is subject to wide fluctuation. The budget uses the current exchange rate for all its conversions.

1. USAID

a. Road Reconstruction

(1) Long Term Technical Assistance. FY1984 cost is estimated at $125,000 per year. Two supervisory engineers for two years each beginning September/October 1984.

(2) Short Term Technical Assistance. FY 1984 cost is $10,500 per month. Budgeted at three months during the first year of the contract and an additional three months in the second year.

(3) Spare Parts and Maintenance. USAID will provide a total of $500,000 towards the maintenance and purchase of spare parts for the Roads Branch equipment used by the regraveling units in rural road reconstruction. GOS will proivde the balance. If the GOS is unable to provide project vehicles, part of the $500,000 may be used for this purpose.

b. Water Gauging Stations

(1) Purchase 18 strip chart recorders at a cost of $3000 each. Twelve to be purchased the first year and the balance the second year.

(2) Purchase 3 talemetric equipment at a cost of E9,000 each. All purchased the first year of the project.

(3) Purchase 19 metal towers to support river water-gauging devices at a cost of $5000. Twelve to be purchased the first year and the balance the second year.

(4) Short term technical assistance to assist Water Resources Branch in siting the new wiers. Cost estimated at $12,000.

3. Government of Swaziland

A. Rural Road Reconstruction

(1) Two Swazi engineers to work with supervisory engineers for two years. Total cost of the GOS is E9,500 per person per year. (All local costs.)

(2) GOS to provide each engineer with a house (including furnishings) and make regular repairs as needed. Estimated cost E750 per long term contractor per month. (Ninety percent of this will be local costs, the balance imported and counted for USAID purposes as foreign exchange.) In addition office space is provided at E500 per month plus E300 per month for office staff support.

(4) In the past five years the regraveling units have spent E616,000 to E779,000 per year on personnel. Because of the increase in work it is estimated that their expenditures will increase to E1.1 million per year during the project. (All of this is local costs.) An additional E800,000 per year will be spent on commodities and the maintenance of plant. (Half of this will be local costs, the balance is counted for foreign exchange).

B. Water Gauging Stations

(1) The GOS will be paying for the repair of all damaged weirs. The cost of this repair is estimated to be E233,500 over the life of project. Three fourths of this will be for personnel and the balance for commodities. (Ninety percent of the total GOS expenditures on water gauging stations will be local costs, the balance is counted for USAID purposes as foreign exchange.)

GOVERNMENT OF THE UNITED KINGDOM

Rural Road Reconstruction

Will provide two engineers for two years each. Total cost of $250,000.

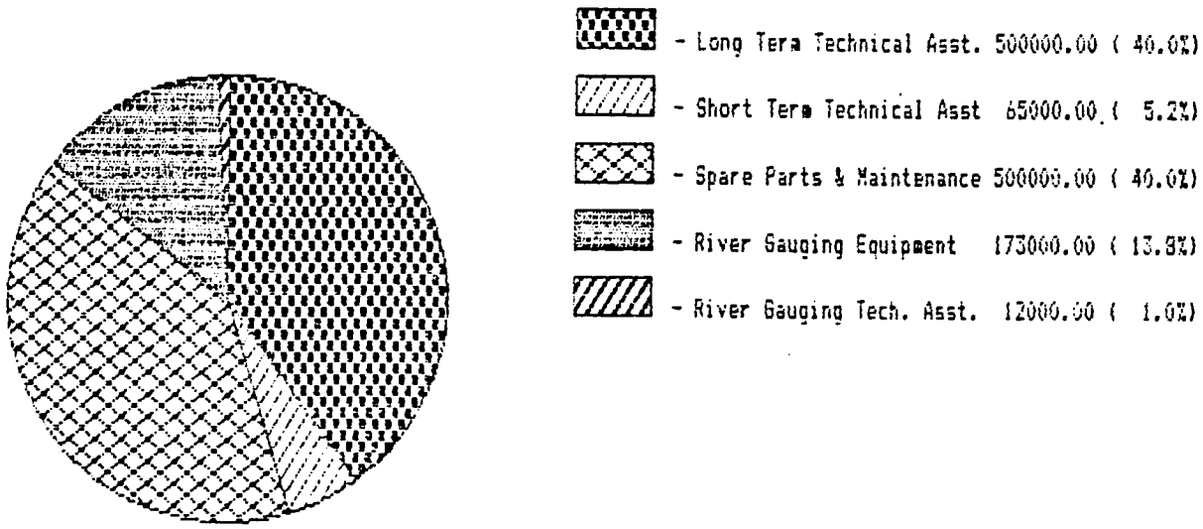
ILLUSTRATIVE USAID EXPENDITURES BUDGET

	fy84	fy85	fy86	TOTAL
Rural Road Reconstruction				
Long Term Tech. Asst.	10,000	250,000	240,000	500,000
Short Term Tech. Asst.	11,000	32,000	22,000	65,000
Spare Parts & Maint.	20,000	300,000	180,000	500,000
sub-total	*41,000*	*582,000*	*442,000*	*1,065,000*
River Gauging Stations				
Water Gauging Equip.	58,000	87,000	28,000	173,000
Short Term Tech. Asst.	0	12,000	0	12,000
sub-total	*58,000*	*99,000*	*28,000*	*185,000*
GRAND TOTAL	99,000	681,000	470,000	1,250,000

OBLIGATIONS

	FY84-TOTAL
Rural Road Reconstruction	
Long Term Technical Assistance	500,000
Short Term Technical Assistance	65,000
Spare Parts and Maintenance	500,000
sub-total	*1,065,000*
River Gauging Stations	
Water Gauging Equipment	173,000
Short Term Technical Assistance	12,000
sub-total	*185,000*
GRAND TOTAL	1,250,000

USAID RURAL RECONSTRUCTION PROJECT BUDGET



TOTAL:1250000.00 (100%)

GOVERNMENT OF SWAZILAND

	fy84	fy85	fy86	TOTAL
Rural Road Construction				
Counterparts	1,000	12,000	12,000	25,000
Personnel	46,000	55[illegible],000	581,000	1,183,000
Equipment	57,000	679,000	710,000	1,446,000
Home/Furnishings		11,000	12,000	23,000
Vehicle petrol/maint.		7,000	8,000	15,000
Office Space		7,000	7,000	14,000
Office Support		4,000	4,000	8,000
sub-total	104,000	1,276,000	1,334,000	2,714,000
River Gauging Stations				
Wier Reconstruction	14,000	72,000	58,000	144,000
TOTAL	118,000	1,348,000	1,392,000	2,858,000

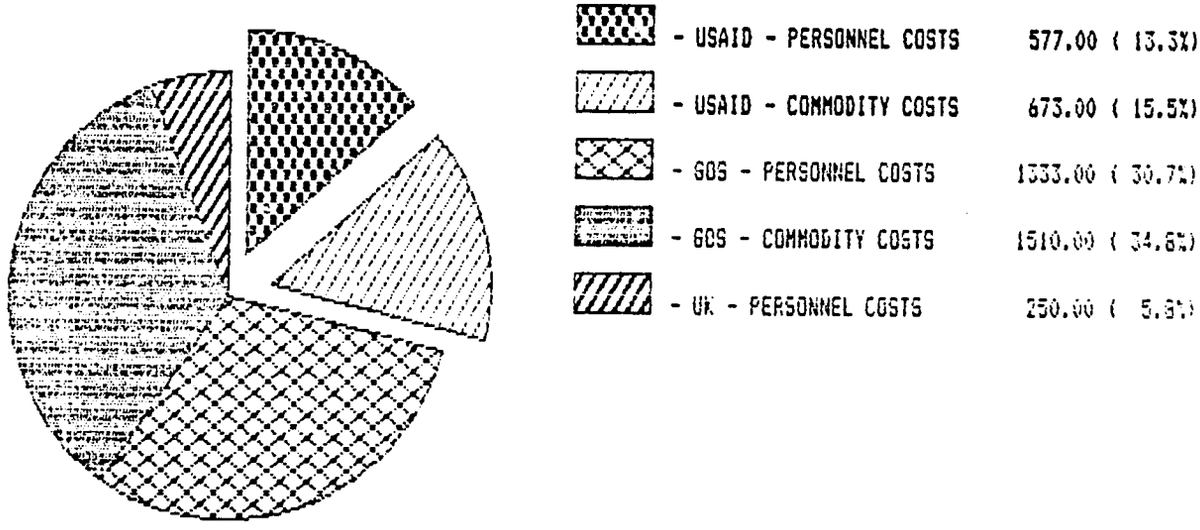
GOVERNMENT OF SWAZILAND
foreign exchange - local cost breakdown

	foreign exchange	local cost	total
Rural Road Construction			
Counterparts		25,000	25,000
Personnel		1,183,000	1,183,000
Equipment	723,000	723,000	1,446,000
Home/Furnishings	2,300	20,700	23,000
Vehicle petrol/maintainance	7,500	7,500	15,000
Office Space		14,000	14,000
Office Support		8,000	8,000
sub-total	732,800	1,981,200	2,714,000
River Gauging Stations			
Wier Reconstruction	14,400	129,600	144,000
TOTAL	747,200	2,110,800	2,858,000

COMBINED EXPENDITURES

	USAID FX	USAID LC	GOVT. OF SWAZILAND FX	GOVT. OF SWAZILAND LC	U.K. FX	TOTAL
Personnel	577,000			1,332,640	250,000	2,159,640
Commodities	379,750	293,250	747,200	778,160		2,198,360
TOTAL	956,750	293,250	747,200	2,110,800	250,000	4,358,000
GRAND TOTAL	1,250,000		2,858,000		250,000	4,358,000
(% total)	28.7%		65.6%		5.7%	100.0%

RURAL RECONSTRUCTION PROJECT COSTS



TOTAL: 4343.00 (100%)

Annex H

SOCIAL SOUNDNESS ANALYSIS

The main social impact of the Rural Reconstruction project will be in the rural areas of Swaziland. The project does not introduce new innovations but attempts to reconstruct farm to market feeder roads and water gauging stations to their pre-cyclone condition. The roads rehabilitation component will directly impact most on the Swazis who live in the rural areas and on those who commute and trade in the rural areas. The water gauging component will directly impact on the end users of river water, mainly small and large-scale irrigators.

Eighty-five percent of the Swazis live in the rural areas; most who live in the peri-urban areas maintain strong ties to rural homesteads. Damage to the road network has reduced the ability of rural Swazis living on the homesteads to freely pursue their economic and commercial activities, mainly agricultural. Also, urban based wage earners have been hampered in returning to help with homestead activities.

This project is totally compatible with the socio-cultural environment in Swaziland. It will in effect reconstruct important rural roads to their pre-cyclone condition and allow once more the unhindered movement of rural Swazis. The rural roads benefit all Swazis and are a major factor in rural development in Swaziland.

The cyclone reduced the access of people in the rural areas to the major produce and job markets in the Mbabane - Manzini corridor. While access is still possible its costs have interact with the rest of the country. The project also increases the ability of Water Resources Branch of the government to allocate water for irrigation purposes. Most of these schemes are operated by women. Earnings from dry land and irrigated farming is a major portion of the income available to women in rural areas of the country.

The rehabilitation works from the cyclone will create a number of un-skilled and semi-skilled jobs. This project will also upgrade the supervisory and management skills of Swazi engineers who have recently completed their formal professional training.

INTRODUCTION

This project will primarily influence the activities of Swazis in rural areas. Most of these people farm on small traditional plots. Some have irrigated holdings or work on the major agricultural estates. This analysis will focus on the social arrangements in rural areas and the importance of the road and rivers to these people.

A. Demography

The de facto population of Swaziland in 1976 was 494,534, which with an estimated annual growth rate of 3.4%, has increased to an estimated 605,000 in 1983. The population is predominantly rural; the urban population amounts to only 15.2% in 1976 as opposed to 12.8% in 1966. The two largest population clusters in 1976 were Mbabane with 23,109 people and greater Manzini with 28,837 people. Today Mbabane is estimated to have a population of 55,000 and greater Manzini has over 65,000. Ngomane, now the third largest town, which had less than 500 people in 1976, has over 30,000 now. In spite of the rural pattern of population, it is unevenly distributed. In 1976 the Highveld had a population density of 30.7 people per square kilcmeter. In the Middleveld there were 43.4 people, the Lowveld had 18.5 people and the Lubombo plateau had 16.3 people per square kilometer.

The areas of highest growth between 1966 and 1976 had been the west-central, primarily middleveld, area embracing Mbabane and Manzini. This growth was due to increased service and manufacturing employment opportunities and the development of commercial agriculture. Since 1976, the third population growth pole has included the Simunye Sugar Estate.

B. Political Institutions

1. Central

Swaziland has a dual system of government consisting of:

(a) a ministerial system of government, many of the ministry's are represented at a local level and

(b) a traditional system of government which has a system of authority running from the King to the local chiefs.

Authority over SNL is vested in Swazi National Council (SNC) whose membership theoretically constitutes all adult Swazi males. The Council is represented by the Central Rural Development Board (CRDB), created in 1954 by the King's Order in Council, and reports, through its chairman, directly to the King. Members of the CRDB, appointed by the King, are mainly chiefs and traditional leaders. In addition the Secretary of the Cabinet and seven Rural Development Officers serve as ex officio members of CRDB.

2. Law

There are two separate judicial systems. One is based on European law and has a High Court and Chief Justice, a Court of Appeal and five district courts, with all judges appointed by the King. Parallel to this system is one based on traditional law and custom in which cases proceed through the family, the local authorities, and then up the political hierarchy of the traditional system.

3. Local government

The country is divided into four administrative districts each headed by a Commissioner who is supposed to coordinate the various governmental activities in his district.

The principal political authority at that level, however, is held by the more influential chiefs of the area. The chiefs are appointed by the King, out the position is usually hereditary.

The residents of a chief's territory owe him allegiance and are obligated to serve him as needed, in particular to till his fields. It is only through the chiefs that the right of every adult, married Swazi man to sufficient land to feed his family may be exercised.

C. Social Institutions

1. Clans and Lineages

The widest kin group to which the Swazi belongs is the clan, a named patrilineal descent group, membership in which is traced through males. These clans are ranked into a series of grades depending primarily on the closeness of their connection to the King. At the top is the royal clan of the Dlaminis; next those which have provided queen mothers, third, those with their own local portions of the country and hereditary chiefs but who have not provided queen mothers; fourth, those who have providing officials for special ritual or administrative functions; and last those without any clan ceremonies or local centers or recognized national representatives (Kuper 1964:16f). These clans do not function as corporate groups (they do not control the distribution of land as they did before the creation of the centralized monarchy) but they still regulate marriage and ties between clan members may be strong. The strength of clan ties depends, as would be expected, on the relative importance of the clans and the advantages to be gained from such links.

2. Homesteads, Households, and Neighborhoods

It is commonly and erroneously asserted that the Swazis live in villages, whereas only in the case of the royal "villages" is there anything of the sort (Sibisi 1982). The basis of settlement is scattered "homesteads" (imiti, sing. umuti). A collection of these may be grouped together into "neighborhoods" within which one individual may be recognized as more influential than others and therefore exercise a degree of informal leadership, but there is not formal village organization with a division of functions such as is characteristic of villages in many other African societies.

These homesteads vary considerably in composition and extent depending on the life cycle of those involved and the ability of their heads to hold them together in the face of various economic vicissitudes and internal tensions. To a certain extent the term "homestead" is also a misnomer, since it implies common residence, whereas sons who have married and physically separated from the parental home may still reckon themselves to be members of the umuti and polygymous men may maintain separate households for their wives even in different chiefdoms. For this reason it might be better to use the more general term "extended family". In any even the umuti is a central institution in Swazi life.

Homesteads are more or less self-sufficient, living off their fields and animals. Now, it is normal for an umuti to have a variety of sources of income. Men of all ages, but particularly the young men, will seek either part-time or full-time employment in the towns or on estates, commonly with the primary aim of accumulating resources to enable them to marry and set up an independent household. Women may seek such employment, particularly if it can be obtained close to home. Women often engage in making a variety of handicrafts for sale; a family may set up a store. Other sources of income are the sale of surplus grain or occasionally animals and cash crops cultivation.

However, whatever the extent to which umuti may participate in the cash economy, it is still regarded as a person's primary means of support and security, and therefore the ties and obligations that bind its members together remain strong. The strengths of this institution, furthermore, may be crucial in enabling the Swazis to make the necessary adaptations to the modern world with the least disruption and hardship. "If any single characteristic of the Swazi umuti provides grounds for long-term

optimistic expectations, it must be its variability - the variety of shapes it can take according to preference, convenience and the ability of its various members to induce one another to accept division, cooperation in old or new forms, and attempts at innovation in practice" (Ngubane 1982:23).

3. Land Tenure, Distribution and Use

About 55 percent of the total land area is Swazi Nation Land (SNL) over which a traditional land tenure system prevails, while 45 percent of the land is under Individual Tenure Farm Land (ITL) held by freehold or concession leases. The ITL, primarily controlled by European residents (frequently with Swazi citizenship) and foreign companies, is devoted to commercial forests, mines, farms, plantations and ranches. When ITL has been purchased in the name of the Swazi Nation, it is sometimes transferred to large-scale plantation activities and other times it is made part of a Rural Development Area (RDA) where traditional agriculture is practiced. Sometimes the land remains idle. In case of transfer to the RDA, the land is distributed by the RDA administration and does not fall under the control of a chief. One percent of the land covers urban areas.

Swazi Nation Land comprises that directly under the control of the King; land designated as Rural Development Areas; and other small-scale farming land. Nineteen percent of SNL is under the direct control of the traditional central government. This includes purchased ITL, Tibiyo Fund (the traditional governments investment house) areas for forests and plantations.

Swazis can obtain land by swearing allegiance to a chief, inheriting it, or borrowing it. In principle, every homestead through its married male head has the right to land for residency and cultivation, and general rights to pasture land and water. The male is expected to ensure that members of his group have a reasonable share of that allocated to the group. Usufructuary rights can be inherited by sons, with the main heir usually receiving the largest allocation. Rights to use are usually secure as long as the homestead fulfills its obligations in the form of tribute labor and occasional gifts to the chief, and is generally law abiding.

In a polygymous household each wife usually is allocated her own field or fields. She stores the output in her own graneries. If additional units are formed, that is, a married son takes up residence with his family, these will be allocated their

own arable land. A male homestead head often retains direct control over some land for cultivation, the produce from which he controls. He may allocate land to others, such as daughters, etc. Women cannot inherit land but obtain usufructuary rights from their husband or, less often, parents or relatives. If a husband dies, the land may remain in the family as long as the wife holds it in the name of a son. If there are no male heirs, she may be dispossessed. Although formerly she was able to obtain land from her parent or relatives, with the increasing shortage of land this is becoming more difficult.

D. Profile of Beneficiaries

In general rural homesteads average 10 members with 42% of all adults and 82% of all homestead heads in wage employment. Some of the wage employees reside on the homestead. In approximately 20% of the homesteads the senior resident is female. A homestead may be composed of a nuclear household or extended family each with its rights and obligations. A homestead may be classified as an economic unit, with the households as sub-units, since usually cattle and land are ultimately controlled by the homestead head. Ninety-eight percent of the homesteads grow crops for consumption. Although most homesteads sell crop surpluses or when they need cash (and later expend cash for the same item), cash cropping is a major source of income for only 20% of the homesteads. At any one time, 67% of the homesteads keep cattle, there being a significant difference between regions.

The cash income which women generate and control usually comes from sale of handicrafts. However, most gross less than E50 a month. Women whose husbands or sons are wage employees can usually depend on some cash remittance. Interviews conducted by the Cropping Systems Project team with female members of the Phopanyani Irrigation Scheme indicate that half expect financial assistance from a husband or son. However, the arrangement for this were not specified, i.e., as a gift, loan or claim on the profits. It seems reasonable to expect that if in a financial position to help, those men now financially helping their wives or mother would assist them to become established in commercial irrigated farming. Damage to the road network has reduced the ability of wage earners to return to help with farm activities, and of farmers to transport their inputs to the farm or outputs to market.

The private irrigation farmers will already be producing crops for the cash market. Also, many will own a tractor and plow, and a pick-up truck to market produce. Most will have initially accumulated savings from wage employment which they invested in agriculture. Some 25% will probably still be engaged in off-farm employment. These men will engaged in off-farm employment usually have a female homestead member responsible for the daily management of their member.

In addition, the project increases the ability of the GOS through the Water Resources Branch to allocate water for irrigation purposes. Although the major groups benefitting from the GOS' ability to apportion water resources are the large irrigated plantations, hundreds of current and future small-scale irrigation farmers will also benefit.

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Annex I

TECHNICAL ANALYSIS

A. Roads

The roads network of Swaziland (1,700 miles) is composed of 22% asphalt surfaced, 54% gravel surfaced, and 24% unimproved dirt surface. The flood of January 1984 caused considerable erosion in the highveld of northern and western Swaziland of embankments, drainage ditches, and of gravel and dirt surfaces. In the low veld of southern and eastern Swaziland, culverts and bridges were blocked with silt and debris from this erosion, stream channels were de-stabilized, and nearly every bridge suffered damage or loss.

The project distinguishes between the regular and ongoing maintenance program on roads and the extraordinary effort now required to repair the major erosion, rebuild damaged and lost structures, stabilize channels, and remove silt and debris which are obstructing drainage. Major rebuilding work will be accomplished through contracts.

This network and its restoration are the responsibility of the Roads Branch of the Ministry of Works. As presently organized, the roads network is divided into four quadrant districts with 17 field work camps. Each district has a group of maintenance equipment, distributed among these work camps. In addition there are four equipment groups (three regraveling units and one bitumen unit) which are responsible for the periodic major resurfacing of roads as required. Another equipment group, the construction unit, is responsible for the upgrading of dirt tracks to road status.

A fleet of 230 pieces of equipment and vehicles is assigned to Roads Branch for the maintenance and improvement of the road system. The Central Transport Authority (CTA) is responsible for the maintenance and replacement of this fleet, upon request from the using agency (Roads Branch). Of this fleet, 66 pieces are assigned to the three regraveling units and the construction unit.

The Roads Branch plans to divert and direct the three regraveling units and the construction unit to reconstruction work, while leaving normal maintenance to the other equipment units as normally scheduled. This approach will permit the GOS to maximize the participation of its own forces while of necessity posing various other more major reconstruction works for contract.

The GOS is scheduling higher budget allocations to cover an expanded work program for these four field units. To enable maximum response to that program, several additional items of equipment must be added to balance these field units, equipment that is down for repairs must be restored quickly, and the leadership and supervision of these units must be improved.

The desired composition of these field work units has been assessed and the GOS is proceeding to secure an additional two vibrating rollers, three concrete mixers, one flatbed truck, one excavator, and one lowboy truck/trailer. As required, equipment may also be hired on a short term basis to meet priority field needs and keep the group operating.

In order to restore down equipment quickly to operating condition, and to enable rapid repairs, during operation, an equipment specialist is being brought in under a direct AID contract, for up to ten weeks to assess needs, sources, and costs of initial repairs and to assist the GOS to establish contracts for supply of repair services and parts during the course of the project.

The equipment will be indentified by serial number and assigned solely to these four field groups. A modified management system will be established with the CTA to depute a CTA mobile field team of two mechanics and supporting gear to each field group. This team will do preventive maintenance and light field repair and adjustment. The lead mechanic will identify promptly to the supervising engineer any more serious repair concerns which will then be referred on a work order basis against the maintenance support contracts. These work orders will be authorized by the supervising engineer in consultation with a member of the CTA where appropriate.

AID inputs will be utilized for the backlog of repair parts and services necessary to place these four work groups into operating condition; for technical assistance; for repair parts, tools, and services necessary during the conduct of the project, in conjunction with funds budgeted by the GOS; and short term equipment hire. GOS inputs will cover costs of personnel, fuel and lubricants, administrative costs, and of materials.

The condition of the road system has been assessed kilometer by kilometer in the field shortly after the flood by a team of short term road engineers seconded by the British government. This detailed information and proposed remedial actions are stored on GOS computer. (ref. attached sheet, this Annex).

Two roads engineers will be employed for a two year period in line responsibilities in the Roads Branch to assist in planning, designing, and supervising the work of the four field groups devoted to reconstruction. These engineers will verify already on-going progress on the reconstruction work and plan the disposition of each group of equipment and fully direct its activities. They will develop a control system that will keep them fully advised of the status of equipment, personnel, support materials, and of repairs and parts.

The two supervising engineers will be primarily responsible for developing the efficient operation of the four field groups. As time permits, they will also be available for consultation to Roads Branch officers responsible for the regular road maintenance program.

The balanced composition of these four field groups is as follows:

TYPE	REQUIREMENT PER UNIT	TOTAL REQUIREMENT
Dozer	2	8
Grader	2	8
F.E. Loader	1	4
Vibrating Roller	1	4
Hand Compactor	1	4
Concrete Mixer	1	4
Tipper	4	16
Flatbed	1	4
Water Tanker	1	4
Pickup	2	8
Scraper	Ø	2
Excavator	Ø	1
Lowboy	Ø	1

B. RIVER GAUGING

Thirty-three gauging stations on five rivers were damaged by the flood, including various weirs, supporting towers for recorders, recorders themselves, and telemetry. This network of stations is the responsibility of the Water Resources Branch of the Ministry of Natural Resources who have carefully assessed the damage at each site. The GOS will undertake the restoration of twenty-one weirs through contracts on its own at an estimated cost of $160,000. This field work will be carried out during the next two dry seasons.

AID inputs will occur up front with procurement of 19 replacement towers, 18 recorders, and 3 telemetry units at an estimated cost of $173,000. In addition AID will also fund the services $12,000 of a consulting civil engineer firm resident in Swaziland to assist the Water Resources Branch engineer in assessing

and scheduling remedial work to be done on the weirs and to prepare bidding documents. These engineering services are required immediately and are expected to be underway before the signature of an AID agreement with the GOS on this project in order to complete these assessments and initiate repairs while the dry season holds.

Source/origin of services will be U.S. or Code 941 for the two supervisory roads engineers, U.S. for the equipment specialist, and Code 935 for the short term civil engineer on the river gauging weirs, and host country and Code 935 on equipment repair and hire.

Source/origin of goods will be U.S. for river gauging recorders, and Code 935 on telemetry, host country or Code 935 on recorder towers, and U.S. or Code 935 on parts and hired equipment.

Annex J

PROCUREMENT LISTS

10th July 1984

The Ministry of Works, Power & Communications
P.O. Box 58
Mbabane

Dear Sirs,

RECONSTRUCTION OF DAMAGED GAUGING WEIRS

Following the meeting in your offices on Monday the 9th July 1984, we set out our proposals for engineering services in connection with the proposed re-construction of damaged gauging weirs. The processes for each individual weir site will vary slightly depending on conditions particular to it, but in general the assignment will cover the following steps:

1. A site investigation with observations and whatever measurements are possible to establish the extent of damage and assessment of those sections of the existing works that could be incorporated into the repaired structure. Particular attention will also be paid to preparatory work necessary before reconstruction such as cofferdamming and diversion of river flows. Material sources will also be investigated.

2. In respect of each site so examined a report will be prepared describing the existing situation and presenting proposals for reconstruction. These will include consideration of the magnitude of the task and whether it should be let out to contract, proposals for sequence and programme of construction, technical sketches outlining the nature and extent of work to be done and an estimate of the cost of the repair work.

3. Drawing up of tender documents and supervision of construction in the case of those weirs where it is decide that the repair work should be undertaken under contract.

It is understood that gauges GS3 and GS6 are priority sites at this moment. It is further understood that the reports on these two sites will be the deciding factor for extension of the commission to cover up to as many as seventeen different sites.

Until or unless a different method of evaluating professional services is agreed we propose that the scale of time charges and expenses, as contained in the Ministry of Words circular of 17th October 1983 be the basis of our charges.

We thank you for asking us to undertake this assignment.

Yours faithfully,
WATERMEYER LEGGE PIESOLD & UHLMANN
Mr. Thabede
Mr. Jenkins

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Job Title:	ROADS REHABILITATION ENGINEER
Function:	Supervision of the rehabilitation of the road damages caused by Cyclone Domoina.
Immediate Supervisor:	Senior Roads Engineer, Roads Branch, PWD.
Job Purpose:	To restore the damaged road network to pre-Cyclone standard by the efficient utilization of the available resources of personnel, equipment, materials and budgeted funds.
Job Activities:	-Planning of rehabilitation programmes. -Preparation of budget estimates for rehabilitation programmes. -Consultation on and coordination with those responsible for regular maintenance of concerned roads. -Consultation on and coordination with major contract works to rebuild bridges and roads. -Reporting of progress and activities of rehabilitation. -Directing clerks of works and subordinate staff (of rehabilitation vote.) -Monitoring of implementation and expenditures. -Training of counterpart engineers. -Supervision of direct labor and contract works on rehabilitation. -In coordination with CTA designee, authorize repairs of equipment through work orders on repair contractors.
Responsibilities:	-Accountable for funds expended in rehabilitation in concerned zone. -Maintain status control on expenditure versus budget. -Accountable for the preparation of recurrent budget and rehabilitation estimates. -Accountable for the efficient training of counterpart as well as appropriate training of technicians and non-professional maintenance staff. -Accountable for the direction and management of rehabilitation work crews and equipment. -Responsible to establish effective control of disposition, use, and repair of equipment. -Assure prompt attention to repair of equipment.

Qualifications: Civil Engineering degree, registered or chartered professional engineer. Minimum ten years professional engineering experience, with at least five years experience in organizing and managing roads construction works. Experience in the conduct of a public works agency responsible for maintenance of gravel and dirt roads in essential. Experience in developing countries is desirable.

Procurement List

Telemetry Equipment

The Water Resources Branch (WRB) operates a system of radio telemetry stations which send river levels and precipitation data to the WRB headquarters every 20 minutes. A typical station contains radio transmitters and receivers, and circuit boards for timing signals, voltage regulation, a modem, analogue and digital input cards and microprocessor.

The system was custom built, installed and maintained by:

Vincent Mandy
P.O.Box 89585
Lyndhurst
Republic of South Africa
2106

Expansion of the system was planned under the terms of contract signed with Mr. Mandy on November 29, 1983. The proposed expansion included river and precipitation gauging equipment at GS-6, GS-16, GS-29 and GS-30, two repeater stations to relay signals to Mbabane, and test equipment to diagnose faults in the system while in the field. The total amount of the contract was E47,440.00.

The equipment has been delivered, but installation of the new stations has been delayed because of damage caused by Cyclone Domoina. Further, the telemetry equipment in the Mbuluzi Basin at GS-10, GS-32 and the Simunye weir, which were destroyed by Domoina, have a higher priority to the WRB than the Usutu and Komati River stations. WRB plans to replace the Mbuluzi Basin stations during the current dry season with equipment which would have been used for the Phase II expansion. The estimated cost of the diverted equipment is E26,000.00 ($18,000).

The replacement telemetry equipment will be purchased from Mr. Mandy, because of the need to maintain compatibility with the existing system. The quality and performance of the original system was such that WRB entered a second contract with Mr. Mandy for the PhaseII expansion. Compatibility with the existing system is critical for maintenance and training reasons.

Recorders

All river gauging station recorders used by the WRB have been purchased from:

Leupold & Stevens
P.O. Box 688
Beaverton, Oregon 97005
U.S.A.

The WRB uses Leupold & Stevens type A-71, with the following accessories:

float line, 125 mm bead spacing, 14m long end hooks, 2 each
float, copper, 203mm/8" Diam
Lead weight, 10oz
float pulley, 375mm C, 125mm bead space
sprocket, right, w/bearing, Metric
sprocket, left, w/set screw, Metric
Chain Assy., type A Stylus carriage, Metric
Pen, Glass Reservoir
Negator Spring
Chart, A-25, Metric
pencils, 4B lead
ink, black, 30cc/1 oz
Cleaner, pen

Addition costs include freight, insurance, cartage, and forwarding fees. A telex was sent on June 27, 1984, requesting a price quotation for 6 recorders, equipped as listed above. The WRB has not received a response as of July 17, 1984. The last recorders purchases by the WRB cost US $3,006.50 each on an invoice dated September 29, 1983.

The staff of the WRB is responsible for the installation and maintenance of all WRB recorders.

Towers

Bids for construction of the gauging station towers will be requested from at least five Swazi companies presently known to be capable of performing this task. the estimated cost of the steel towers is E9,000.00.

Road Equipment Parts and Repair Services

Bids will be requested for the initial repair of down equipment and for the supply of parts and repairs as required during operation. Although the open competitive route will be explored, it is expected that parts and services will be obtained from the manufacturer authorized agencies.

These agencies include:

Caterpillar and Wright (Earth Moving)
Barlow Tractor Company
Johannesburg, RSA and Manzini, Swaziland

Nissan and Mercedes Benz (Trucks)
Tracar
Mbabane and Manzini, Swaziland

Galion (Earth Moving)
Dresser Industries, S.A.
White River, R.S.A.

Annex K

IMPLEMENTATION SCHEDULE
ROADS COMPONENT

JULY/SEPT 1984	OCT/DEC 1984	JAN/MARCH 1985	APRIL/JUNE 1985	JULY/SEPT 1985
-Sign Grant Agreement. -Receive Service Tenders. Candidate Supv. Eng.	-Clear C.P.'s Sign Eng. Contracts. Complete initial repair series. Initiate Supv. Eng. Activity.	-Initiate operating repair sequences -Draw up Six mo. work plan		
-AID/Eng review Tenders and Eng. Candidates		-May/June AID/Engr Monitor Visit June-mid term evaluation		
IVER COMPONENTS				
-Receive/Review -weir eng. report. -Prepare tender documents/release to bidders (AID to review).	GOS Budget and tender for weir contracts. GOS own forces on weir works.	-Award weir contracts		
		-Award contracts on towers, recorders, and telemetry.	-Receive towers and telemetry and a portion of recorders.	
	-Install towers/recorders		-Install towers and recorders, and telemetry equipment.	

OCT/DEC 1985	JAN/MARCH 1986	APRIL/JUNE 1986	JULY/SEPT 1986	OCT/DEC 1986
-Weir works.				
6 mo. work plan		-6 mo. work plant		
-AID/Eng. Monitor visit.			-Eng. final report and for remaining work.	PACD
		AID/Eng. Monitor Visit.		

Annex L

Source: MWC Roads Branch Document

ROADS BRANCH PRIORITY LISTING
FOR THE DISASTER RECONSTRUCTION PROJECTS
PWD ROADS

A team of British, American, and Swazi engineers evaluated the various road sites damaged as a result of Cyclone Domoina. This did not include, however, the major bridges which were destroyed, nor the Grand Valley road which must be reconstructed. The estimated costs of repairs were computed for each site and a work priority was assigned. The priority was made based on the condition of the site and its ability to withstand further storm runoff and traffic.

The task of assigning a priority rating to each of the sites identified was accomplished by assigning a value to the importance of the road (1 to 10) and multiplying the value of the site (1 to 12) to arrive at a set of unique numbers for each possible combination.

ROAD VALUES

The most important factor considered when determining the importance of a road was the current volume of traffic on the road. All roads with a traffic count in excess of 500 vehicles per day (Average Daily Traffic - ADT) were classified as priority one roads. Most of these roads are bituminous surfaced or scheduled to be surfaced in the near future. Also classified as priority one roads are those roads which consitute the national skeleton system which this provide access to all regions of the country.

Following the same procedure, a system for priority two roads which serve the rural centers was developed. The remainder of the District roads were assigned a priority of three.

The weighting of each classification is as follows:

PRIORITY ONE	-	10
PRIORITY TWO	-	7
PRIORITY THREE	-	5

SITE PRIORITY

The site priority was assigned by the inspecting engineers on a scale of one to four as follows:

1. IMMEDIATE ATTENTION NEEDED. The road is closed or will be closed if the repairs are not carried out immediately.

2. HIGH PRIORITY. The repair should be done before the next rainy season.

3. MODERATE PRIORITY. The repair must eventually be done but not necessarily before the next rainy season.

4. LOW PRIORITY. Failure to carry out repairs will result in increased maintenance.

It was further determined that the site priority was more important than the road classification. The weighting of the four categories was first made on a scale of 1 to 12. Resulting in the following:

PRIORITY ONE - 12
PRIORITY TWO - 8
PRIORITY THREE - 5
PRIORITY FOUR - 3

To complete the weighting process, the value of each site was multiplied by the importance of the road to give a composite score. The higher the score, the higher the combined priority of the site. The possible combinations fell into one of twelve categories shown in the following table.

Composite Weighting

		ROAD VALUE		
		ONE	TWO	THREE
SITE PRIORITY	One	120 (1)	84 (2)	60 (4)
	Two	80 (3)	56 (5)	40 (7)
	Three	50 (6)	35 (8)	25 (10)
	Four	30 (9)	21 (11)	15 (12)

The overall ranking appears in parentheses with the combined score showing immediately before it.

In applying this method to each site, a clear separation of priority was established. A complete list of sites by district by overall priority is shown in the following table.

MBABANE DISTRICT - TOP SIX PRIORITIES
ROAD EVALUATION REPORT

ROAD I.D. NUMBER	SITE BY KM.	TYPE OF WORK	COST IN EMALANGENI	DOLLAR COST EQUIVALENT
*Composite score is 1				
M 1A	27.60RD	Road	E 33,600	
M 1A	32.60B	Bridge	9,600	
M 1B	12.60C	Culvert	4,584	
M 9D	4.60B	Bridge	2,200	
SUBTOTAL			E 49,984	$35,000
*Composite score is 3				
M 1A	13.90RD	Road	E 810	
M 1A	18.60RD	Road	80	
M 1A	24.80RD	Road	11,250	
M 1A	25.90RD	Road	950	
M 1A	25.90RD	Road	5,790	
M 1A	26.70RD	Road	1,200	
M 1A	28.40RD	Road	100	
M 1A	28.50RD	Road	1,900	
M 1A	28.90RD	Road	200	
M 1A	29.60RD	Road	410	
M 1A	31.30RD	Road	22,140	
M 1A	31.40RD	Road	27,040	
M 1B	2.70RD	Road	416	
M 1B	9.70RD	Road	812	
M 1B	12.40RD	Road	3,228	
M 1B	13.20C	Culvert	1,274	
M 1B	14.40B	Bridge	216	
M 1B	14.60RD	Road	150	
M 1B	17.20C	Culvert	484	
M 1B	20.70B	Bridge	5,444	
M 1B	21.30B	Bridge	19,610	
M 1B	22.70C	Culvert	14,244	
M 1B	23.30C	Culvert	500	
M 1B	25.30C	Culvert	4,618	
M 1B	25.70C	Culvert	1,144	
M 1B	29.50C	Culvert	1,056	
M 1B	36.50C	Culvert	5,460	
M 3D	9.10B	Bridge	300	
M 9D	3.90RD	Road	2,160	
M 9D	6.90C	Culvert	2,280	
SUBTOTAL			E135,266	$ 95,000
*Composite score is 5				
M 19B	5.10C		E 1,180	$ 826

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ROAD I.D. NUMBER	SITE BY KM	TYPE OF WORK	COST IN EMALANGENI	DOLLAR COST EQUIVALENT
*Composite score is 6				
M 1	14.40RD	Road	E 3,240	
M 1A	24.60RD	Road	896	
M 1A	28.00RD	Road	64	
M 1A	30.40RD	Road	2,920	
M 1A	31.20C	Culvert	2,800	
M 1A	31.60C	Culvert	1,178	
M 1A	32.40C	Culvert	200	
M 1A	33.20RD	Road	3,930	
M 1A	35.70RD	Road	1,240	
M 1A	38.20RD	Road	2,440	
M 1B	6.70RD	Road	580	
M 1B	11.30RD	Road	300	
M 1B	11.70RD	Road	150	
M 1B	11.90RD	Road	892	
M 1B	14.40B	Bridge	212	
M 1B	24.60RD	Road	380	
M 1B	26.30RD	Road	80	
M 1B	36.50RD	Road	8,160	
M 2C	2.20C	Culvert	930	
M 3A	1.10B	Bridge	4,700	
M 3B	11.10RD	Road	80	
M 9D	5.40RD	Road	180	
M 9D	16.50L	L.L.Cross	400	
M 9D	18.60C	Culvert	8,734	
M 9D	20.90C	Culvert	10,066	
M 18	14.30RD	Road	80	
M 18	15.40RD	Road	836	
M 18	33.60RD	Road	836	
D 38	0.20B	Bridge	11,682	
D 38	2.70C	Culvert	200	
D 38	8.70B	Bridge	960	
D 38	11.30C	Culvert	260	
SUBTOTAL			E 69,040	$ 48,328
TOTAL FOR DISTRICT			E255,470	$179,000

LUBULI DISTRICT - TOP SIX PRIORITIES
ROAD EVALUATION REPORT

ROAD I.D. NUMBER	SITE BY KM	TYPE OF WORK	COST IN EMALANGENI	DOLLAR COST EQUIVALENT
*Composite score is 1				
M25	3.40C	Culvert	E 5,000	
M25	10.00B	Bridge	49,260	
M25	21.30B	Bridge	10,800	
M29	0.00B	Bridge	43,400	
SUB-TOTAL			E108,460	$ 76,000
*Composite score is 4				
D28	12.00L	Low Level	E141,260	
D28	10.00C	Culvert	2,800	
D28	8.0C	Culvert	24,000	
SUB-TOTAL			E168,060	$118,000
*Composite score is 5				
M8C	22.20C	Culvert	E 2,400	
M8C	9.00B	Bridge	1,780	
M11C	1.00B	Bridge	1,600	
M11C	3.30C	Culvert	1,400	
M11C	4.00C	Culvert	400	
M11C	0.50C	Culvert	1,200	
M10B	1.0C	Culvert	4,880	
M21	16.00		3,600	
M21	21.00L	Low Level	43,400	
M21	36.00C	Culvert	1,000	
*SUB-TOTAL**			E 73,660	$ 51,500
TOTAL FOR DISTRICT			E350,180	$245,000

NHLANGANO DISTRICT - TOP SIX PRIORITIES
ROAD EVALUATION

ROAD I.D. NUMBER	SITE BY KM	TYPE OF WORK	COST IN EMALANGENI	DOLLAR COST EQUIVALENT
*Composite score is 1				
M4	27.36B	Bridge	E 8,272	
M13	30.44B	Bridge	15,220	
M13	7.86B	Bridge	5,120	
SUB-TOTAL			E 28,612	$ 20,000
*Composite score is 2				
M8	0.80B	Bridge	E 22,960	
M8	13.98B	Bridge	12,980	
M8	1.26L	Low Level	17,748	
M30	34.79C	Culvert	3,280	
M30	10.86B	Bridge	3,900	
M30	19.60B	Bridge	25,660	
M12	2.76L	Low Level	16,800	
M10A	0.00C	Culvert	14,976	
SUB-TOTAL			E118,304	$ 82,800
*Composite score is 3				
M4	1.87B	Bridge	E 6,650	
M4	34.95B	Bridge	800	
M13	21.10C	Culvert	560	
M13	15.50C	Culvert	1,400	
SUB-TOTAL			E 9,410	$ 6,600
*Composite score is 4				
D8	10.60C	Culvert	E 1,924	
D8	10.70C	Culvert	7,620	
D8	10.80C	Culvert	1,924	
D8	31.30L	Low Level	106,000	
D19	0.40C	Culvert	2,624	
D19	0.60C	Culvert	2,624	
D19	0.80C	Culvert	2,624	
D19	1.30C	Culvert	9,236	
D19	1.60C	Culvert	700	
D19	1.80C	Culvert	1,400	
D19	3.10C	Culvert	1,050	
D19	4.0C	Culvert	3,560	
D19	4.30C	Culvert	1,400	
D19	5.40C	Culvert	1,924	

ROAD I.D. NUMBER	SITE BY KM	TYPE OF WORK	COST IN EMALANGENI	DOLLAR COST EQUIVALENT
*Composite score is 4				
D19	5.50C	Culvert	E 2,274	
D19	6.10C	Culvert	6,296	
D19	6.30C	Culvert	2,064	
D19	7.00C	Culvert	15,250	
D19	7.20C	Culvert	13,750	
D19	7.50C	Culvert	1,924	
D19	7.80C	Culvert	1,924	
D19	7.90C	Culvert	12,300	
D19	8.30C	Culvert	6,350	
D19	8.60C	Culvert	6,600	
D19	10.90RD	Road	39,056	
D19	15.60L	Low Level	7,000	
D19	18.60L	Low Level	9,840	
D15	0.10C	Culvert	9,308	
D56	0.71C	Culvert	3,850	
D56	4.66L	Low Level	9,000	
D57	4.15C	Culvert	14,144	
SUB-TOTAL			E305,540	$214,000
*Composite score is 5				
M8	17.27B	Bridge	E 3,000	
M8	19.61B	Bridge	11,150	
M8	15.90C	Culvert	1,750	
M30	15.17B	Bridge	8,200	
M30	33.75B	Bridge	2,200	
M11A	17.00RD	Road	14,400	
M12	11.57B	Bridge	8,200	
M10A	6.24C	Culvert	8,600	
SUB-TOTAL			E 57,500	$ 40,000
*Composite score is 6				
M4	39.45B	Bridge	E -	
M4	6.18C	Culvert	1,400	$ 980
SUB-TOTAL			1,400	980
TOTAL FOR DISTRICT			E520,766	$365,000

SITEKI DISTRICT
ROAD EVALUATION REPORT

ROAD I.D. NUMBER	SITE BY KM	TYPE OF WORK	COST IN EMALANGENI	DOLLAR COST EQUIVALENT
*Composite score is 1				
M5	25.90L	Low Level	E 12,120	
M5	32.90C	Culvert	310	
M5	44.10C	Culvert	128	
M5	56.40C	Culvert	7,934	
M5	71.80C	Culvert	924	
M8	25.00C	Culvert	11,848	
M8	18.80C	Culvert	-	
M8	16.00C	Culvert	2,376	
M8	15.10C	Culvert	2,376	
M8	14.60C	Culvert	6,216	
SUB-TOTAL			E 44,232	$ 31,000
*Composite score is 2				
M16	1.50C	Culvert	E 218	
SUB-TOTAL			E 218	$ 150
*Composite score is 3				
M3	0.10RD	Road	E 528	
M3	0.10RD	Road	1,378	
M3	3.60PC		16,578	
M3	7.70C	Culvert	14,000	
M3	18.80RD	Road	256	
M3	20.50RD	Road	218	
M3	24.50RD	Road	432	
M3	41.30C	Culvert	11,564	
M3	43.30C	Culvert	256	
M5	15.00C	Culvert	1,082	
M5	25.30C	Culvert	2,830	
M5	33.10C	Culvert	310	
M5	33.20C	Culvert	1,210	
M5	33.30C	Culvert	244	
M5	33.70C	Culvert	46,396	
M5	35.70C	Culvert	1,072	
M5	65.30C	Culvert	242	
M8	24.80RD	Road	11,280	
M8	23.20C	Culvert	210	
M8	18.50C	Culvert	13,820	
M8	14.40C	Culvert	2,158	
M8	11.90C	Culvert	16,700	
M8	4.00RD	Road	1,242	
M24	19.40C	Culvert	218	
M24	24.60C	Culvert	3,558	
M28	4.00C	Culvert	3,896	
SUB-TOTAL			E152,206	$107,000

ROAD I.D. NUMBER	SITE BY K.M.	TYPE OF WORK	COST IN EMALANGENI	DOLLAR COST EQUIVALENT
*Composite score is 4				
D10	6.80L	Low Level	-	
D29	3.50C	Culvert	E 110	
D29	9.00L	Low Level	2,114	
D29	9.20L	Low Level	16,560	
D29	12.10C	Culvert	3,578	
D29	18.80C	Culvert	110	
D29	26.00L	Low Level	43,876	
D42	45.50C	Culvert	2,854	
D89	1.00RD	Road	-	
D89	20.10L	Low Level	16,200	
D89	22.80L	Low Level	8,540	
D92	1.40C	Culvert	-	
D97	11.50C	Culvert	1,156	
SUB-TOTAL			E 95,098	$ 67,000
*Composite score is 5				
M16	2.00C	Culvert	E 2,020	
SUB-TOTAL			E 2,020	$ 1,400
*Composite score is 6				
M3	3.10RD	Road	-	
M5	3.80RD	Road	E 1,024	
M5	6.40RD	Road	6,240	
M5	14.60RD	Road	1,440	
M5	15.20C	Culvert	540	
M5	16.50RD	Road	-	
M5	17.80RD	Road	640	
M5	19.00RD	Road	-	
M5	21.70RD	Road	5,690	
M5	22.40RD	Road	864	
M5	23.10RD	Road	-	
M5	23.20RD	Road	864	
M5	24.40C	Culvert	2,524	
M5	24.70RD	Road	1,360	
M5	28.00RD	Road	2,064	
M5	29.80RD	Road	640	
M5	31.30RD	Road	864	
M5	33.40C	Culvert	72	
M5	35.20RD	Road	560	
M5	35.90C	Culvert	1,404	
M5	36.00C	Culvert	1,296	
M5	37.20C	Culvert	180	
M5	37.60RD	Road	864	
M5	48.90C	Culvert	1,118	
M5	50.20C	Culvert	1,010	

ROAD I.D. NUMBER	SITE BY KM	TYPE OF WORK	COST IN EMALANGENI	DOLLAR COST EQUIVALENT
*Composite score is 6				
M5	60.80C	Culvert	E 110	
M5	61.80R	Road	-	
M5	63.20RD	Road	-	
M5	64.60C	Culvert	110	
M5	0.10C	Culvert	-	
M5	2.20C	Culvert	110	
M5	2.60RD	Road	864	
M5	3.90RD	Road	864	
M5	8.40RD	Road	-	
M8	34.40RD	Road	64	
M8	34.10RD	Road	128	
M8	33.00RD	Road	-	
M8	32.50RD	Road	64	
M8	31.10RD	Road	-	
M8	27.60RD	Road	1,394	
M8	27.10RD	Road	3,300	
M8	25.60RD	Road	64	
M8	21.60C	Culvert	1,010	
M8	16.60C	Culvert	2,324	
M8	13.90C	Culvert	39,200	
M8	10.80C	Culvert	2,798	
M8	9.20RD	Road	640	
M8	9.10C	Culvert	1,572	
M8	6.00C	Culvert	2,060	
M24	7.90C	Culvert	11,150	
M24	8.00RD	Road	864	
M24	11.10C	Culvert	272	
M24	15.10C	Culvert	1,638	
M24	15.90C	Culvert	218	
M24	23.60C	Culvert	5,390	
M28	1.70RD	Road	-	
M28	2.10RD	Road	-	
M28	3.40RD	Road	3,596	
M28	3.70RD	Road	12,800	
M28	4.20RD	Road	-	
M28	5.60RD	Road	-	
SUB-TOTAL			E123,862	$ 86,700
TOTAL FOR DISTRICT			E435,818	$305,000
TOTAL FOR FOUR DISTRICTS			E1.6 million	$ 1.1 million

Include: 120 Culverts
30 Bridges
15 Low level crossings

Note: Cost Data was taken from costs of record on recent contracts without adjustment, and are stated only as an indication of overall magnitude of work.

ANNEX M

INITIAL ENVIRONMENTAL EXAMINATION

Project Country: Swaziland

Project Title and Number: Rural Reconstruction (645-0224)

Funding: FY 1984 U.S. $1,250,000

IEE Prepared By: Robert D. Adams, REDSO/ESA and Reviewed by REA

Environmental Action Recommended: Positive Determination _____
Negative Determination X

Justification:

The project will reconstruct or rehabilitate sections of existing roads to their normal standard. The patterns of traffic following these works will be those to which the people have been accustomed. No new cultural impacts are therefore anticipated; however, transport difficulties existing since the January flood will be eased.

Actual site work will create local disturbance of dust, noise, and clouding of streams with disturbed silt. However, the sites are fairly isolated from settlements and animal life and these disturbances will have minimal or no impact on local environment and general ecology.

The AID inputs to this GOS ongoing effort are expected to accelerate the schedule of works and to shorten the period of disturbance. The environmental effects are forseeable and minimal. Further environmental assessment should not be necessary, therefore we are requesting a negative determination.

Clearances: John Gaudet (July 25, 1984)
REDSO/ESA Environmental Officer
Gary B. Bisson (August 7, 1984)
Regional Legal Advisor

Concurrence: AFR, Bureau Environmental Officer, by Cable STATE 239445, dated August 14, 1984