

PDBB 300

CLASSIFICATION
PROJECT EVALUATION SUMMARY (PES) - PART I

Report Symbol U-44

1. PROJECT TITLE RURAL ROADS IMPROVEMENT MAURITANIA	2. PROJECT NUMBER 682-0214	3. MISSION/AID/W OFFICE USAID MAURITANIA
4. EVALUATION NUMBER (Enter the number maintained by the reporting unit e.g., Country or AID/W Administrative Code, Fiscal Year, Serial No. beginning with No. 1 each FY)		
<input type="checkbox"/> REGULAR EVALUATION <input checked="" type="checkbox"/> SPECIAL EVALUATION		

5. KEY PROJECT IMPLEMENTATION DATES A. First PRO-AG or Equivalent FY <u>82</u> B. Final Obligation Expected FY <u>90</u> C. Final Input Delivery FY <u>90</u>	6. ESTIMATED PROJECT FUNDING A. Total \$ <u>16,283,000</u> B. U.S. \$ <u>11,291,000</u>	7. PERIOD COVERED BY EVALUATION From (month/yr.) <u>1/87</u> To (month/yr.) <u>12/87</u> Date of Evaluation Review <u>12/13/87</u>
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8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR		
A. List decisions and/or unresolved issues; cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., airgram, SPAR, PIO, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED
- Verification of Project Goal and Purpose Achievement to be included in December 1988 Evaluation	USAID Engineer	Dec., 1988
- Assure that tax exoneration on Project fuel and materials are granted by the GIRM in a timely manner	USAID Engineer	Jan., 1988
- Assure that present Chief of Base (COB) is retained for another year and that acceptable Assistant COB is appointed and trained	GIRM Project Engineer	March, 1988
- Issue Project Implementation Letter (PIL) extending Project Assistance Completion Date (PACD) to April, 1990 and reflecting other requirements identified in the evaluation	USAID Engineer	Feb., 1988
- Approve use of project funds to accomplish major improvements to assure all-weather use of roads	USAID Engineer	Jan., 1988
- Initiate action to find replacement for Douglass	USAID Engineer	Jan., 1988
- Set-up series of periodic meetings with GIRM and donors to coordinate efforts in the transportation field	Director of Public Works/ USAID Engineer	March, 1988
- Assist GIRM in development of a general training plan for public works	GIRM Project Officer/USAID Engineer/Other Donors	March, 1988
- Determine USAID's participation in implementation of training plan	USAID Engineer	March, 1988

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS

<input type="checkbox"/> Project Paper	<input checked="" type="checkbox"/> Implementation Plan e.g., CPI Network	<input checked="" type="checkbox"/> Other (Specify) <u>Issue PIL</u>
<input type="checkbox"/> Financial Plan	<input type="checkbox"/> PIO/T	<input type="checkbox"/> Other (Specify) _____
<input type="checkbox"/> Logical Framework	<input type="checkbox"/> PIO/C	
<input type="checkbox"/> Project Agreement	<input type="checkbox"/> PIO/P	

10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT

A. Continue Project Without Change

B. Change Project Design and/or Change Implementation Plan

C. Discontinue Project

11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles)

RAYMOND DOUGLASS, US PSC/ENGR, USAID
 CHEIK SID AHMED, DIR. PUBLIC WORKS, GIRM

12. Mission/AID/W Office Director Approval

Signature: 

Typed Name: ARTHUR LEZIN, DIRECTOR

Date: 1/18/88

RURAL ROADS IMPROVEMENT
MAURITANIA (682-0214)

Special Internal Evaluation of First Year Maintenance Program

13. SUMMARY

Project Purpose and Outputs:

The Rural Roads Improvement project was designed to increase access to and thereby stimulate economic development of the Guidimaka and Gorgol regions by providing an all-weather transportation network to facilitate agricultural production and improve access to markets. This involves: 1. construction of 333 km. of rural roads. 2. establishment of maintenance capability to maintain rural roads improved under the project. 3. establishment of a mobile construction brigade for further road improvements of the USAID financed roads and 4. conducting a training program for counterparts and road brigade personnel.

Progress Made in Achieving Project Outputs:

Road construction was completed in Dec. 1986. During the construction phase (May 1983 - Dec. 1986) a total of 233 kms. of new road and 164 drainage crossings were built between the regional capitals of Kaedi and Selibaby. In addition to this work, the main road between Boghe and Kaedi (100 kms) was rehabilitated. The Boghe-Kaedi road links the Rural Roads project road to the Mauritania's national highway system.

Maintenance work on all 333 kms. of road (Boghe-Kaedi-Selibaby) began in Jan. 1987 under a Fixed Amount Reimbursable (FAR) agreement between USAID and GIRM. During the year 1987, the roads have been bladed and/or dragged each month to minimize corrugations and maintain the surface. Additional gabion work was done to repair and reinforce drainage structures as found necessary as a result of the rainy season (June-Sept.). Prior to the start of the rainy season, drainage canals were cleaned and straightened to improve the anticipated flow of water. Major drainage structures were protected with riprap and the Selibaby bridge foundations were strengthened and protected.

Thirty-five members of the construction brigade were retained for the maintenance program. These workers are receiving continuing on-the-job training in how to maintain secondary gravel roads through the use of such methods as dragging, blading, surface replacement, gabion radiers, placement of riprap, and stream alignment. Repair and maintenance of equipment is carried out at the brigade work camp in M'Bout by members of the brigade. Maintenance supplies and spare parts for the equipment are also located at the M'Bout camp.

Maintenance Phase Activities

71

Amendment No. 3 to the Rural Roads Improvement Project Agreement provides for USAID to finance maintenance for the 333 km of road between Boghe and Selibaby, improved under the original project agreement and Amendment No. 2.

The USAID contribution to the maintenance program is a total of \$800,000 over the three year period January, 1987 - December, 1989. The total is to be used as follows:

1st year - \$300,000 for Boghe-Kaedi-M'Bout-Selibaby road sections

2nd year - \$300,000 for Boghe-Kaedi-M'Bout-Selibaby road sections

3rd year - \$200,000 Kaedi-M'Bout-Selibaby road sections

14. EVALUATION METHODOLOGY

A. PROJECT IMPLEMENTATION LETTER (PIL) NO. 11

Project Implementation Letter No. 11 dated November 25, 1986 sets forth the terms and conditions under which USAID will provide financing for the 1st year. Subsequent year financing will depend upon the results of a reassessment of the maintenance operation near the end of the 1st year. Based on this review, USAID may renew the agreement for an additional period under the same terms, or as mutually agreed with the GIRM.

DISCUSSION

PIL No. 11 sets forth conditions and requirements to be met by GIRM in the implementation of the project. These items and the observations of the USAID and REDSO Engineers are as follows:

1) Personnel Requirement - GIRM will retain selected members of the construction brigade to work on the maintenance phase.

Comment - Thirty-some members of the construction brigade were selected by GIRM and USAID to form the maintenance brigade. The brigade is led by the Chief of Base (COB), who was the expatriate Construction Supervisor for the Consultant, Morrison-Maierle, during the construction phase of the road. During the past year individual members of the brigade and the brigade as a unit have proven to be very effective.

2) Equipment -

Requirement - CIEM will provide a minimum mix of the equipment utilized during the construction phase to perform the maintenance phase work. The list of minimum equipment is shown in Attachment No. 2 to the Letter of Implementation.

Comment - The equipment specified in Attachment No. 2 has been made available for use by the maintenance brigade, and has been supplemented as necessary by GIRM. Spare parts, materials and operating supplies for the equipment have also been made available to the maintenance team.

3) Plans & Specifications

Requirement - Maintenance will be performed in accordance with Plans and Specifications jointly developed by the GIRM and USAID, included in PIL No. 11 as Attachment No. 4.

Comment - Maintenance work is being performed in accordance with the plans and specifications.

Requirement - The GIRM will prepare quarterly maintenance plans defining the specific operations and identify work items to be accomplished during the following three-month period.

Comment - Quarterly maintenance plans have been prepared by the GIRM Chief of Party and approved by the GIRM Project Engineer and USAID Engineer prior to initiation of the work.

4) Inspections -

Requirement - USAID will have the right to make periodic inspections of the maintenance to assure that the work conforms to plans, specifications and standards agreed upon.

Comment - Inspection of the road maintenance work, equipment, shop and warehouse operations is made by the USAID Engineer on a monthly, sometimes bi-weekly basis. The GIRM Project Engineer accompanies the USAID Engineer on some of these field visits.

5) Unacceptable Work

Requirement - USAID will advise the GIRM of any unacceptable work or performance observed and which is not eligible for reimbursement.

Comment - USAID has not found it necessary to refuse payment on any work to date.

6) Reassessment

Requirement - USAID will conduct a reassessment of the maintenance operation at the end of the one-year FAR agreement to decide if the agreement should be renewed for an additional period.

Comment - The present operation is the required assessment.

7) Payment Rates -

Requirement - USAID will reimburse the GIRM fixed amounts based on the satisfactory completion of certain maintenance work units, facilities improvements and associated technical assistance costs.

Comments - Requests for payment are prepared by the GIRM Maintenance Brigade Chief on a monthly basis, using unit costs for various items of work specified in Implementation Letter No. 11 as applied to quantities of each work item performed during the month.

8) Method of Payment -

Comment - The GIRM Project Engineer approves the request and submits it to USAID. The USAID Engineer makes a field trip at the end of each month to verify that work being billed has been performed in a satisfactory manner. USAID makes monthly payments to GIRM on the basis of these verified requests. An initial advance of \$20,000 was liquidated during the first five months of the maintenance project. Since then additional advances have been granted and their liquidation is being closely monitored.

9) Method of Disbursement of Funds -

Comment - USAID presents the monthly FAR payment to the Secretary-General of the Ministry of Equipment and obtains a receipt. The check is deposited to Special Project Account No. 118120 in the Treasury. Information is provided to USAID by GIRM of all activity re the account, i.e. deposits and withdrawals, and USAID maintains a computer program showing this information and the status of the account at any moment.

10) Turnover of Equipment and Materials -

Requirement - Attachment No. 3 to PIL No. 11 contains a list of all the operational equipment under the project administration for which the GIRM is to assure the repair, maintenance and safeguarding. Other materials turned over by GIRM include the inventory of spare parts, tires, fuel oil and lubricants left over from the construction phase.

Comment - This has been done in accordance with PIL No. 11.

11) Unexpected Events -

Requirement - Reimbursement under the F.A.R. arrangement is intended to cover the normal cost of road maintenance not to exceed \$300,000 for the 1st year. In the event of the occurrence of natural disasters such as major flooding, any repair costs are to be the subject of separate consideration and negotiation between the GIRM and USAID.

Comment - Normal maintenance costs for the first year's operation are less than the \$300,000 authorized and sufficient funds remain available to perform repairs caused by major flooding and damage to drainage crossings. Therefore, it will not be necessary to authorize additional funds for these repairs during the 1st year.

B. LOGICAL FRAMEWORK

The Project Design Summary - Logical Framework, attached as Annex A to the Rural Roads Improvement Project Paper, lists the project goal, purpose, outputs and inputs, and indicates objectively verifiable indicators and means of verification for each. Most of this framework applies to the Construction Phase of the project but some items relate to the maintenance phase as well. Comments on the maintenance phase items follow:

1) PROGRAM GOAL - to improve the social and economic well-being of the rural population of the Guidimaka and Gorgol Regions.

Comment -

A period of one year since completion of the Boghe-Kaedi-M'Bout-Selibaby road improvement is not sufficient time to properly evaluate the effect of the road on the population of the area. We propose to respond to this point as part of our December 1988 evaluation, when the effect of the road will be more fully established.

2) PROGRAM PURPOSE - To facilitate access to markets and the means of moving social services and agricultural inputs into potentially high food production areas.

Comment -

A sociological study to collect and evaluate data on the effect that the road is having on movement of food and health and agricultural services and other government inputs into the area, increase of commercial activities and effect on agricultural production and marketing is presently underway. The results will be presented as part of the December, 1988 evaluation.

3) OUTPUTS -**a) All-weather Rural Roads Constructed/Repaired and Maintained**

A total of 333 kms of rural roads were constructed and improved under the construction phase of the project. Monthly field visits by the USAID Engineer find that these 333 km of road are being maintained as planned to assure year-round use.

As a result of the recent rainy season, several points on the road have been identified as needing further improvement to assure all-weather use. The GIRM is preparing a request to USAID for assistance in performing the necessary improvements before the next rainy season.

b) Rural Roads Maintenance organization/facilities strengthened to maintain rural roads improved under project

The construction camp at M'Bout is being used as the base for the road maintenance brigade. The camp itself is fully functional and well maintained. The equipment earmarked for maintenance was carefully selected as the most suitable for maintenance operations. Personnel trained as Equipment Operators, Mechanics, Warehouse Supervisor, Accountants, etc., during the construction phase have been retained for the maintenance brigade. Equipment is well maintained and a supply of necessary spare parts, tires, lubricants and supplies assured through inventory control procedures.

c) Improved access to Kaedi-Selibaby road along Boghe-Kaedi road

The Rural Roads Improvement Project included the upgrading of the Boghe-Kaedi road to the minimum standards required to permit all-year use. Maintenance of this section is included in the present project for a two-year period, after which the road is scheduled to be completely rebuilt under an Arab Fund financed project.

The Arab Fund project has now been designed and bids have been received for the construction, which is scheduled to start during 1988 and be completed in one year. During 1988, the USAID maintenance program will continue to assure access to Kaedi.

5 76

C. REDSO ENGINEER INPUT

The REDSO Engineer's (RE) inputs were limited to the review of progress of the recommendations made in the REDSO trip report. This was due to time constraints, but even more to the fact that the project implementation in general was proceeding extremely well.

His methods of reviewing progress included discussions with the Project Officer and his Assistant, review of project and GIRM administrative documents, meetings with the Director of Public Works, the Director of Equipment, the Project Director, the Chief of Equipment Maintenance at the national workshop, his Technical Advisor, and the new Training Specialist, also at the national workshop.

15. EXTERNAL FACTORS

A. COMMENTS ON PROJECT IMPLEMENTATION

Events occurring during the 1st year of road maintenance which had an effect on implementation of the program included:

1) Reinforcement of the Selibaby Bridge - The consensus of several USAID, REDSO, GIRM engineers was that the gabion abutments on which the Selibaby bridge was constructed did not appear adequate to assure that the bridge would resist the force of moving water during the rainy season. Therefore, the road maintenance brigade was asked to place additional gabions and large stone riprap to protect the abutments. This was accomplished and the bridge withstood the rains of 1987 without damage.

2) Approval of 1987 List of Imports for Project

By letters of May 13 and October 15, 1987, the USAID Director transmitted a list of commodities and fuel to be procured for the Rural Roads Project during 1987 and requested that action be taken to obtain tax exoneration for the items. Until October 1987, fuel was being obtained from the amount previously authorized for the construction phase.

However, in October, 1987 the last of this allotment was used and the maintenance brigade had to stop work on October 31 due to lack of fuel for the equipment. Finally on November 24, a special exoneration of 60,000 liters of diesel fuel was approved and the fuel truck delivered 15,000 liters to M'Bout so work could start again. The remaining 45,000 liters of this special exoneration is now being delivered. However, unless the official tax exoneration for a years supply of fuel, lubricants and spare parts is approved in the near future, the work will stop again in January or February, 1988. Exoneration is the responsibility of

the Ministry of Equipment, and serves as a key indicator of GIRM support for donor assistance efforts.

Included on the list of items and fuel to be exonerated are two agricultural tractors purchased with project funds for use on the road maintenance program. These tractors arrived in Mauritania in February, 1987 and have been held by the supplier since then pending receipt of a waiver of custom duties.

Action Being Taken

We are following-up with the Ministry of Equipment on a daily basis in an effort to assure that action is taken to obtain the blanket tax exoneration in the near future.

3) Requirement for Full Time Project Administrator

During the frequent absences of the GIRM Project Officer, there was no one in the Department of Public Works to handle the many administrative matters required to keep the job moving - USAID Engineers have been doing what they can to help. Most of this work is administrative in nature - not technical. In October 1987, the GIRM appointed a full time person to handle this administration. The participation of the Project Officer is still required for overall management and coordination with USAID, and for the technical aspects of the project.

4) Prompt Payment of Salaries to TP Brigade Staff

Employees at M'Bout were getting increasingly upset about late payment of salaries. USAID inspection and certification of work performed each month has been moved up to the last days of the month being billed, and the USAID check is given to the GIRM by the 5th of the following month. However, delays by the GIRM in preparing the payroll and sending the paymaster to M'Bout for payment of the salaries continued to occur.

Action Being Taken

The GIRM has recently improved their administrative procedures to permit earlier preparation of the M'Bout payroll and is supplying transportation for the paymaster to travel to M'Bout as early in the month as possible.

5) Establishment of Petty Cash for M'Bout Camp

There has been a continuing problem in purchasing miscellaneous supplies and materials required to keep maintenance equipment operating. The COB was using his personal funds for this purpose.

Action Taken

Upon urging from USAID, the GIRM recently set up a petty cash account for the use of the COB.

6) Prompt Payment of Monthly Invoice

Payment by USAID of Monthly Invoices received from the GIRM were taking from 30-45 days after the end of the month being billed due to the time required to prepare and send the invoices to Paris, issuance of checks by the Paris Disbursing office and receipt of the checks in Mauritania. Therefore, the GIRM was not able to purchase fuel, spare parts and supplies for the equipment or pay salaries on time.

Action Taken

A procedure has now been established whereby the USAID Engineer and GIRM Project Engineer visit the project during the last 2-3 days of each month, pick up the statement of work performed during the month from the COB, verify that the work has been satisfactorily performed and hand carry the statement back to Nouakchott for immediate processing. In the meantime, the USAID Engineer has on-hand an advance check from the Paris Disbursing office for the estimated amount of the invoice and can make payment immediately. Any difference between the amount of the advance check and the invoice is reflected in the GIRM account as an advance or debit to their account, to be liquidated or adjusted in later payments. Payment for each month is now made by the 5th of the following month.

7) Change in Unit Price Schedule

The original schedule of unit prices to be paid for work under the FAR did not provide for channel alignment work, which has to be performed to assure proper flow of water to the fords.

Action Taken

In order for the T.P. Brigade to be paid for doing this necessary work, Implementation Letter No. 12 dated May 12, 1987 modified the unit price schedule to include the new work item.

8) Training of Assistant Chief of Party

At the insistence of USAID, the GIRM agreed to hire an expatriate engineer (Mr. Billa) as Chief of the T.P. Maintenance Brigade at M'Bout, on condition that he be replaced by a Mauritanian engineer after a suitable period of training. However, the Mauritanian engineer named by the GIRM (Wad) as Mr. Billa's Assistant, who should be acceptable as the person to replace Billa, does not appear to be someone that USAID would agree to as the COB. Due to Mr. Wad's attitude toward the work and use of project equipment and materials for his personal activities, a conflict has developed between the Assistant COB and COB, and little or no training has taken place.

Action Being Taken

The GIRM has been requested to look into this situation and take action to resolve the situation, possibly by changing the Assistant COB. One thing that the GIRM has done is to issue Note de Service N[028 (M.E. dated June 19, 1987), which defines the duties and responsibilities of the COB and his Assistant. This, however, has not resolved the issues of training and replacement.

As a condition to continuing with the second year of the program, USAID should request that Billa be retained as COB, for another year, that a Mauritanian engineer acceptable to USAID and Billa be named as Assistant COB, and that he be trained by Billa to take over as COB by the end of 1988.

9) Extension of PACD

Implementation Letter No. 11 specifies the Project Assistance Completion Date (PACD) as September, 1989. In view of the late start of the Maintenance Phase of the project (January, 1987). The three year program will end in December, 1989. In addition, some flexibility is required to permit final actions and payments to be accomplished.

Action to be Taken

The PACD should be extended to April 1990.

10) Improvement of Major Crossings

It became apparent during the last rainy season, that the construction phase of the project should have included improvements to drainage crossings at several additional points on the road, as during and after each rain traffic is interrupted for periods of up to two weeks due to the excessive depth of water at these points.

The F.A.R. arrangement for reimbursement of road maintenance costs was intended to cover the normal costs of maintenance, and is not to be used to cover major repairs or damages to the roads sustained as a result of unusual or other natural disasters. In the event of the occurrence of these disasters, such as heavy flooding or rain damages, any related repair or improvement costs are to be the subject of separate consideration and negotiation between GIRM and USAID.

Action to be Taken

In continuation of the Rural Roads Improvement Project, USAID should consider using some of the funds remaining in the project budget to cover the additional costs involved in making improvements to the drainage crossings which are causing interruption to traffic. Specific problem crossings and proposed solutions for improvements are the following:

a) Crossing at Nabina - This crossing is the principal problem point on the Boghe-Kaedi road section. During most of the rainy season, the depth of water over a large area prevents all traffic from passing. Large trucks and 4-wheel drive vehicles are able to get across a narrow portion of the drainage canal by detouring several kilometers to the south, but even then many vehicles have difficulties.

Action to be Taken

As a part of the Arab Fund financed project for reconstruction and paving of the Boghe-Kaedi road, a causeway will be built along the axis of the road to resolve the problem. However, this will not be done in time for the next rainy season. Therefore, it is proposed to construct a gabion radier across the narrow portion of the canal to assure continued passage of traffic until the permanent crossing is completed and in use.

b) Crossing at Budami and Tourem - These are two ravines on the M'Bout-Selibaby road which flood to a depth of 1-2 meters with each rain. Box culverts are needed at these crossings.

c) Crossing at Garfa - This major problem point on the M'Bout-Selibaby section is flooded to a depth of 2-4 meters for 2-3 weeks at a time. Needed is a bridge or series of box culverts to permit all-weather use.

d) Various Crossings - During the construction phase, an attempt was made to identify all drainage crossings on the Kiedi-M'Bout-Selibaby sections and to construct a radier at each point. However, during the present rainy season, the road has washed out at several locations where no radier was provided. These additional drainage crossings should be protected with raders to prevent future washouts.

At other locations, sheet erosion is taking place over extensive lengths of the road. The road should be raised at these points and the drainage channalized to existing or new radiers.

Design of the improvements can be accomplished by T.P. and USAID Engineers and the T.P. Maintenance Brigade can perform the construction with their present staff and equipment, as supplemented by temporary day laborers picked up from villages adjacent to the work sites.

11) REDSO Engineers Comments

a) General - The Reassessment has shown that the project is working as planned. The road is getting quality maintenance at low cost. Therefore, continuation of the maintenance program for another year poses no problem. However, the RE Engineer has taken this opportunity to examine more far reaching issues than were raised in the last REDSO Engineering Trip Report. These issues concerned, among others, institutionalization of the maintenance project, other donor collaboration, long-term sustainability, and training. All were being addressed more rapidly and profoundly than he could have hoped for. Now, more than ever USAID has a chance to make a difference if, repeat if we can stay the course.

b) National Road Maintenance Program: The most significant change in the project setting has been the GIRM's change in priorities from road construction to road maintenance. A recent donors meeting which concentrated on road maintenance attests to such a change. The donors have to be given some credit for this change. It must also be admitted that the results of the meeting were funding promises mainly for "periodic" maintenance and maintenance of paved roads. This leaves the routine maintenance of our project roads to fend for itself against all other competing demands for the extremely limited general maintenance funds available in the GIRM budget. But even these budget items are increasing: from 100 million ouguiyas in 1986 to 140 million in 1987. Also, the important fact is that the GIRM is paying attention to Maintenance much more now than at the beginning of this project.

16. LESSONS LEARNED: (RE Comments) The main problem with the project, is institutional. The maintenance work is outstanding. The road's condition is evidence of that. And the cost of doing road maintenance is less than expected. The brigade is trained and performing well with only one expatriate on the staff. But without him and without the USAID Engineering Office, it is doubtful that the results would be so positive.

What is lacking is the adequate staffing of the Central office of Public Works. They have excellent people at the top. But the performance of their mid-level people leaves much to be desired. Exactly what is required to improve performance has not been determined, it could be just added incentive...or more training. But it is sure that something is missing. The USAID Assistant Engineer is spending so much time at Public Works doing their work for them that many people think he works there.

There are several other institutional problems which hinder the project. Internal controls are adequate as long as USAID is so closely involved, and as long as the expat Superintendent is on the job. However, there are some loopholes and systems and procedures that lack the clarity and adequate penalties for not following them. Since these problems are not critical to the success of the project they should be improved within the context of the overall system of road maintenance in Mauritania.

These institutional problems cannot be solved by USAID alone, nor can they be eliminated over night. Much depends on the resources other donors are putting into the process. From the recent meetings the GIRM has had with all important Donors, it seems that resources are being made available.

The amount of \$60 million was pledged at one meeting for a 5 year program of road maintenance. In addition, the World Bank has promised to set up a Project Office to plan and manage the use of these funds. They will also be able to help with training. USAID has begun a close collaboration with the Ministry of Equipment and French cooperants at the public works equipment park. The USAID Mauritania Rural Roads Project is beginning to be considered a model. Training for other projects will very likely take place in part at M'Bout. This is just one of the elements of the TOR, drafted by the USAID Engineer, for the development of a Training Plan for the Ministry of Equipment. This draft TOR has already served as a guide for the French Training Specialist at the PW equipment park.

All these things demonstrate more progress than could have been hoped for on the recommendations from the last RE trip report. Things are coming together. Nonetheless, everyone agrees that the GIRM will not be in a position to continue the maintenance of our project roads in two years independently. At a minimum, they will still need partial financial assistance. USAID is already considering approving the use of counterpart funds to allow the project to continue until institutional problems and issues can be resolved.

The main lesson learned here is that road development in Mauritania is not a short term nor isolated activity. This is true in the third world in general. More importantly, if USAID doesn't isolate itself from other donors, and sticks with a program, the results can be far reaching.

If USAID sticks with this project and works hard to continue coordination with other donors, helping to lead the way, a vicious circle of construction and reconstruction through continuing routine maintenance in Mauritania can be broken. If USAID drops out before the GIRM or others are ready, all may be lost. USAID is on the verge, admittedly the verge may be several years long, of really making a difference.

17. SPECIAL COMMENTS

Continuation of USAID Engineering Support - The services of the present USAID Chief Engineer (Douglass) are scheduled to terminate in mid April, 1988. Based on discussions of other engineering activities with the Engineering office and the work requirements, if USAID is to have the impact desired on road maintenance the RE believes that replacement of Douglass with another U.S. Engineer is more than justified.

It is felt that Hassan can do all the routine work required to manage the road maintenance project. However, it will be asking too much to expect Hassan to accomplish by himself, all of the collaboration needed with World Bank Officials, French Cooperants, Saudi and Kuwaiti Diplomats, along with the high level policy dialogue required with the GIRM. Although Hassan can probably accomplish any task demanded of him as well or better than anyone else at the same level of experience, it is recommended he be given the opportunity to continue developing at the more reasonable rate he's shown under the guidance of Douglass. A replacement is recommended for Douglass.

If, however, the Mission does not replace Douglass, the RE recommends that the USAID request increased REDSO/WCA Engineering support ASAP. Douglass recommends visits of at least 10 days every two months. The Engineer in Dakar might be an alternate source of support.

18. RECOMMENDATIONS

- a. The road maintenance program should be continued for another year.
- b. Continuation of the services of the present COB for the next year should be a requirement.
- c. Selection and training of an Assistant COB acceptable to USAID should be accomplished during 1988.
- d. Improvement of GIRM's administrative procedure for exoneration of taxes, payment of salaries, purchase of spare parts, etc. should be closely maintained.

- e. The use of available project funds for making improvements to the roads to assure all year use should be approved.
- f. PIL should be issued to reflect the above changes to the project.
- g. Action should be initiated to find a replacement for C/Engineer Douglass.
- h. A series of periodic meetings should be established with the GIRM and other donors in the transportation field to coordinate efforts.
- i. An overall plan for training of GIRM personnel in road and road equipment maintenance should be developed.
- j. The USAID should decide on the extent of their participation in the implementation of the GIRM's training program and proceed accordingly.
- k. Another Internal Evaluation of the program should be conducted in December, 1988.
- l. The PACD should be extended to April, 1990.

Drafted by: RD R. Douglass, USAID ENGR
 - G. Thompson, REDSO ENGR

Clearance: A. Lezin, DIR
 W. Boehm, ADIR/P *W. Boehm*

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 A. Gilboy, HRD
 P. Mandel, HLTH
 G. Thompson, ENGR REDSO
 R. Douglass, ENGR

Malaria
expenses

HTV/PP/SWA

- ① TA contract may be
@ local market
- ② Design fee
- ③ TA team fee for 30 days
- ④
- ⑤ 1/2 reimbursement
low price film
- ⑥ Gov fee

MAURITANIA: RURAL ROADS PROJECT, 682-0214

- ⑦ Why advice to UN (20)
- ⑧

** EVALUATION **

USAID/Mauritania
April, 1984

TABLE OF CONTENTS

- I. INTRODUCTION
 - A. The Evaluation: Purpose and Methodology
 - B. Project History
 - C. Summary Findings
 - 1. Inputs
 - 2. Outputs
 - 3. Conclusions
 - 4. Modifications Extant
 - 5. Options for Future Implementation
 - 6. Recommendation

- II. DETAILED RECOMMENDATIONS
 - A. Prime Contractor/Morrison-Mairle
 - B. GIRM/Public Works (PW)
 - C. Procurement
 - 1. General
 - 2. Supply Management Office (SM)
 - 3. United
 - D. Financial
 - E. USAID Project Monitoring/Management
 - F. M'Bout - Km. 70

- III. CURRENT STATUS OF IMPLEMENTATION
 - A. Progress to Date
 - B. Equipment Status
 - C. Contract Team Status
 - 1. Work Site
 - 2. Organization and Planning
 - 3. Reports
 - 4. Training
 - 5. Construction Contract
 - 6. Implementation Alternatives

- D. Status of GIRM/Public Works Contribution
 - 1. General
 - 2. Personnel
 - 3. Funds
 - 4. Maintenance
 - 5. Work Requests
 - 6. Ferry Landing at Gouraye
- E. Status of Procurement
 - 1. SMO
 - 2. UNSO/OPE
- F. Financial Status
 - 1. Financial Situation
 - 2. Financial Management
- G. USAID Project Monitoring/Management Status
 - 1. Project Management Information System
 - 2. Equipment Specialist
- H. M'Bout to Km 70

IV. SIGNIFICANT CHANGES FROM PROJECT PAPER EXPECTATIONS

- A. Introduction
- B. Technical Revisions
- C. Implementation Revisions
- D. Financial Revisions

V. OPTIONS FOR FUTURE IMPLEMENTATION

I. INTRODUCTION

A. THE EVALUATION

The purpose of this evaluation is (a) to judge the efficiency of project implementation; (b) to determine if and how implementation can be improved; (c) to determine what progress can be expected with available funds; and (d) to determine what additional funding is required to complete the project.

The evaluation methodology included a review of relevant project documentation; visits to the project sites; meetings with interested parties; preparation of a draft report; additional analysis and field work to address issues raised by project committee in response to the draft; and preparation of the final report.

The costing information available for the preparation of this evaluation in March 1984 was less accurate than might be desired. Construction has started too recently to develop an adequate sense of routine costs. Similarly, some of the judgements we have made have been based on preliminary plans and reports which are only now being finalized. Despite these constraints we chose to proceed with the evaluation. The urgent need for additional funding and development of revised long-term plans dictated this decision.

The Project Evaluation Committee is composed of the following people:

George Thompson, ENG, Chairperson
Barry MacDonald, PDE (Alternate - Campbell McClusky)
Vicki MacDonald, OPI
Jannine Baranyanka, SMO (Alternate - Paul Lacerte)
Wayne Butler, CONT
Richard Goldman, A/DDIR

B. PROJECT BACKGROUND

A PID for a Trail and Track Project Improvement (682-0214) in the Guidimaka was approved on December 15, 1978. The PP design was scheduled for March 1980. The PID called for the upgrading of approximately 300 km of existing tracks and trails over a five-year period to conform to the minimum standard (45 km/h reference speed) for all weather use. In October and November 1979, USAID was approached by UNSO to consider joint financing of a road from M'Bout to Selibaby. AID was to finance heavy road equipment of U.S. origin (e.g. Mack trucks, CAT bulldozers, etc.); UNSO would fund design activities, technical assistance and local costs. Arrangements were made by correspondence among the USAID Director, the Director of UNSO (New York), the Director of Infrastructure and the Minister of Equipment and Transport. USAID had significant difficulties putting together the PP design team. In September 1980, UNSO announced it was ready to go ahead with a Project Agreement to construct the first phase of the road for U.S. \$4,300,000. Since AID was still in the design stage, UNSO began construction with possibilities of future collaboration left open.

This separate UNSO project consisted of 70 km of road beginning in M'Bout and heading south toward Selibaby. The original design was for 50 km. This was increased to seventy with no parallel increase in funding. Seventy kilometers of road were finally built with the available funding.. Eventually an AID project was approved which was designed to connect the UN road to the river basin at Gouraye and Kaedi. At Kaedi, it would also connect with a road which provides a very important link within the river basin and to the capital, Nouakchott.

The history of this project explains many of the circumstances that surround the implementation plan and the fact that AID finds itself with a cost increase of considerable proportions. The design assumed that the UNSO model would work -- it did not, 30,000 dollars per km proved to be too low in the difficult terrain in Gorgol. The design assumed that the UN equipment mix was correct and that the equipment inherited from the first phase UN effort would, after one year, be well maintained and ready to go. The equipment was in poor shape, not ready for use and the mix was not appropriate. The project assumed that the UN road would be complete -- a finished product. Last year rains washed out large portions of the road and showed that the design of the drainage structures was inadequate. It will cost approximately one million dollars to put the UN segment of the road into acceptable condition. The design suggested that continuation of the modified force account procedure of construction was a good one.

Based upon the experience of UNSO/OPE that the modified force account could be much cheaper than an A + E contract; using an A + E contractor for the number of kilometers under consideration was out of the question. As it turns out, the UN had considerable problems with its contractor: The final miles of the road were constructed without an engineer on site, and the project suffered as a result.

The AID team has made many adjustments to the basic design of the project to overcome the original erroneous assumptions of both the AID and the UN designs. As a result additional funding will be necessary if the project is to provide the outputs it originally anticipated.

C. SUMMARY FINDINGS

1. Inputs

a) AID

(i) Technical Assistance: Technical Assistance has been provided but personnel problems have left the project without a permanent Chief of Party (COP). (This situation is now being rectified - May, 1984). The per-month cost, implementation timetable, and number of personnel required as set forth in the PP were all underestimated.

(ii) Commodities to carry out earthwork and drainage operations: The lead time required for commodity procurement was greater than anticipated. The quantity and value of required commodities were underestimated due to the poor condition and unacceptable mix of equipment inherited by the project. Procurement is now proceeding in an efficient fashion.

(iii) Training: On-the-job-training of mechanics, operators, foremen and some local Public Work (PW) personnel has been minimal due to the lack of commodities for use in training and the lack of an organized training program. Too few mid-level PW personnel are receiving training.

(iv) Operating costs: Operating costs for a road brigade have been provided. However, grant funds have not been matched by a GIRM contribution as originally proposed. The delayed availability of PL480 funds to cover local costs, has necessitated the use of grant funds for his purpose.

b. Other Donors (UNSO/OPE):

(i) Equipment to carry out earthwork and drainage: The equipment which had been purchased by UNSO/OPE and used for the first 70 km of construction was donated to the USAID Project as expected. Unexpectedly many spare parts and extensive repair work were required to return the equipment to working condition.

c. GIRM:

(i) Salaries for counterparts and Public Works personnel:

The GIRM was unable to meet this requirement for its project personnel. Some of those it could not finance were detached from the Ministry and hired by the project.

(ii) Availability of garage/workshop facilities: The GIRM made available a PW sub-station. This facility has proven inadequate for the Project's needs. A heavy equipment workshop is being constructed in M'Bout.

(iii) Equipment: The GIRM has provided seven important pieces of heavy equipment (approximate value U.S. \$1,8 million). This contribution was not foreseen in either the PP or the Pro-Ag.

2. Outputs

(a) Road Construction: As of February 29, 1984, 70 km of clearing and grubbing, 20 km of fill, 12 km of base and two km of final course had been completed.

(b) Road maintenance: Efforts to improve existing maintenance facilities have only just begun. The limited contacts which currently exist between the TA team and PW sub-divisions should produce some improvements in GIRM maintenance capacity. Increased contact, an operational repair shop at M'Bout and increased road building and maintenance operations should result in a more marked improvement.

(c) Road Brigade: This has been established, but few senior level PW personnel are involved.

(d) Trained Personnel: Thus far, only limited junior level on-the-job training is underway.

3. Conclusions

(a) The design based upon the UNSO model for rural road construction is unsuitable to project conditions. The project cannot achieve its planned outputs, purpose, or goal without major operational/construction modifications to benefit from the experience of the UNSO model, which has shown that: (i) Estimates of drainage requirements (both structures and embankments) were much too low; (ii) estimates of spare parts requirements, optimistically based upon what was assumed to be low mileage used equipment, were far too low; and (iii) Estimates of the time required to execute project tasks were too short (as a result of the poor equipment mix and unrealistic optimism concerning weather and lead times). A minimum of nine additional months are needed for completion of all road segments as originally planned. Project construction costs were underestimated. Unanticipated factors have contributed to upward revisions of costs. Approximately U.S.\$ 5.9 million in additional AID support for T.A., commodities and operating costs are urgently needed to complete the proposed construction.

Road construction, though behind schedule, is proceeding well. A revised timetable could be maintained if implementation planning, field organization, and overall coordination of all parties concerned are improved.

Improvement to and construction of the road segments identified in the project are an essential prerequisite for agricultural development in the area.

4. Modifications Extant

In responses to the inadequacies in the original project design the following changes were made in design standard and implementation procedures:

(a) The Road Design Standard was changed as follows: Platform width from 5.5.m to 7m.; platform depth from 30 cm. to 30 cm above flood waters; alignment curves to 80 km/hr. design speed.

Drainage: Structures were redesigned to accomodate low maintenance and local flash flood conditions.

(b) The Brigade equipment mix was changed to include scrapers. Spare parts were acquired to restore inherited equipment to working conditions.

(c) Construction of a repair shop for heavy equipment was begun at M'Bout.

(d) Twenty-five million UM local cost financing was added for equipment repair, workshop construction and other local costs.

(e) Nouakchott based administrative assistant and SMO personnel were added to the project staff.

5. Options

There are three basic options to be considered:

- A. Continue until current project funds are exhausted;
- B. Provide additional funds to build some segments of the road;

or

C. Provide sufficient funds to build the originally proposed road from Kaedi to Gouraye. If Option A is followed, project activities will end approximately January 1985. At this time the project will have completed construction of the road bed from M'Bout to Selibaby. In addition to the construction there will be an equipment park of well maintained heavy equipment, vehicles and machinery, culverts, and the infrastructure needed (camps, maintenance equipment, etc.) to continue road construction.

Under Option B there are two possible ways to proceed. In either case it is assumed that sound engineering will apply i.e., all construction will include adequate drainage and road specifications as currently approved by AID:

(i) Complete the road segment from M'Bout to Selibaby. Additional cost: U.S. \$.8 million;

(ii) Complete the road segments from M'Bout to Kaedi and M'bout to Selibaby. Additional cost: U.S. \$4.5 million

Financing options, discussed below in detail, include a mix of reobligated and PL 480, Section 206 generated funds.

Option C would complete the road as originally specified in the PP, that is, Kaedi-M'Bout-Selibaby-Gouraye. It would also involve rehabilitation of the UNSO road, M'Bout km 70. Additional Cost US \$5.9 million.

Financing would require a supplement of US dollar funds to cover foreign exchange expenditures and a mixture of PL480 Section 206 funds and deobligated funds for local costs.

6. Recommendations

(a) That additional funding be provided to permit completion of the Kaedi to Gouraye road as described in the Project Paper and Project Grant Agreement. Completion of this project conforms to USAID development strategy and geographical focus. Future project development activities are planned for the Basin and the project road will be essential to support communications and transportation in the Basin area.

(b) The first 70 km, built under the supervision of a UNSO contract team, must be brought up to a minimum standard for all weather gravel roads.

(c) That project planning, organizational, and management adjustments, conforming with the detailed recommendations of this evaluation be incorporated into the project.

II. DETAILED RECOMMENDATIONS

A. Prime Contractor/Morrison-Mairle (M&M)

That the prime contractor, M&M:

1. Provide amenities consisting (at a minimum) of approved visits to Senegal;
2. Adhere to Mauritanian labor conventions;
3. Prepare (a) a comprehensive equipment maintenance plan, including accurate jacket files, maintenance files, and consumption files for each piece of equipment, by June 1, 1984; and (b) appropriately updated summary charts of such files to be included in each monthly report;
4. Establish by June 1, 1984 (a) systematic ordering/receiving and inventory procedures, including systems for flagging ordering requirements and following-up orders, and (b) appropriately updated summary charts for tracking parts and fuel supplies.
5. Formulate network planning, by June 1, 1984, on which to base work schedules and on-the-job time, motion and production calculations. This should be done in coordination with Public Works;
6. Systematize monitoring of performance of all personnel;
7. Inventory and otherwise protect equipment, tools and supplies;
8. Provide guidance, assistance, and supervisory checks for all approved recommendations to assure full implementation;
9. Revise the Project Work Plan and Schedule PWP&S according to 83 STATE 206726 (including training); and
10. Consider possible improvements to the Selibaby Wadi crossing.

B. GIRM/Ministry of Equipment and Transport, Directorate of Public Work

That the Directorate of Public Work of the Ministry of Equipment and Transport:

1. Assist the Contractor in the identification of interested personnel to work on the project including the short-term assignment of selected GIRM personnel to cooperate with the project;

2. Evaluate the feasibility of village maintenance contracts; this evaluation could be conducted in association with the project-funded socio-economic evaluation;

3. Promote increased contact with, coordination of, and assistance from the project to Public Works sub-divisions for Kaedi and Selibaby in developing an innovative maintenance plan of action for incorporation into the Fourth Highway Project; and

4. Promote action in the region and coordination with this project by the World Bank supported Fourth Highway Maintenance Project.

C. Procurement

1. General

That the procurement of two or three new Mack Dump Trucks available in Nouakchott and compatible with existing trucks be considered.

2. Supply Management Office, SMO/USAID

(a) That Project procurement actions be based on concurrence of all relevant parties i.e. SMO, Contractor(s), Project Director (PWA), Project Officer (USAID/OPI/ENGR), and Program Officer (USAID/PROG).

(b) That SMO continue, to issue periodic summary procurement charts that should show estimated arrival date of all project procurement actions still in process.

(c) That procurement receiving reports of all equipment procured by the project be routinely prepared by the prime contractor.

3. United Nations Sahelian Office/Office of Project Execution (UNSO/OPE):

(a) That UNSO/OPE issue periodic summary charts showing estimated arrival dates in M'Bout.

D. Financial

1. That an account be set up in Dakar for small purchases to be managed by the UN Representative. Estimated amount: US\$4,000 advance;
2. That the Project Financial Implementation Plan, now revised, be updated quarterly; and
3. That additional funding be authorized for the project.

E. USAID Project Monitoring/Management

1. That a management information system be put into effect;
2. That an equipment specialist install equipment requisition monitoring systems;
3. That the Project Financial Implementation Plan and Project Network Plan be updated quarterly;
4. That coverage of appropriate benefits for field personnel under the contract be assured, and that every effort be made to alleviate the tension that has developed between USAID and the M&M TA Team.

F. M'Bout to KM 70

That while seeking reimbursement by the United Nations and pending the availability of funds, AID under the auspices of the project should replace drainage structures, raise the road, and eliminate curves as recommended by the contractor (M&M) and the USAID Engineer.

III. CURRENT STATUS OF IMPLEMENTATION

Despite some short-comings, the Rural Roads Improvement Project of the Government of the Islamic Republic of Mauritania has been well staffed (1) with Mauritians and U.S. contract personnel in the field; (2) with experienced spare parts and procurement personnel in Nouakchott; and (3) with able Government and donor engineers in relevant representative roles. Other than the funding and scheduling problems inherited primarily from the design and M'Bout to Km 70 construction phases, all project elements are now in place and functioning as planned. Adjustments for drainage considerations, equipment mix, inventory requirements, and repair facilities have been made. Pending availability of additional funding, all project targets as planned may be achieved by late spring of 1986.

A. Progress to date

1. Road construction: One hundred eighty eight (188) kilometers of road have been repaired. The first 20 kilometers of new road have been laid on an alignment that has been cleared and grubbed well past Selibaby. A drainage plan for the first stretch of road is completed.

2. Equipment: Most equipment is on-line again (with some important exceptions). Two scrapers have been added to the equipment mix. The base camp at Km 77 is equipped to handle all repairs and maintenance. The repair facility in M'Bout is under construction.

3. Management: A draft Project Work Plan and Schedule is complete and revisions are in progress.

4. Projected Construction Rate: The project is expected to reach full force in April 1984. Full force is defined as having all new equipment at the site, the shop at M'Bout in operation and management and planning system in place or being developed. Assuming funding can be obtained, the key to realizing the above scenario is putting in place Management, Organizational, and Planning systems which will improve operation and maintenance of equipment and performance of work force. Such improved systems are required for all project elements as described below. Once full force status is attained it is believed the proposed road could be completed in 23 months.

B. Equipment Status:

The addition of new and used equipment from the U.S. and from the GIRM Direction of Public Works has given the project a truly powerful high production mix. The cost analysis (Addendum 1) estimates that up to 15 km/month through easier terrain can be sustained. A current weakness is the short supply of water trucks. While the existing trucks were adequate for use with dump trucks they cannot maintain the pace set by newly acquired scrapers. The two potential solutions of purchasing more trucks or digging more wells are too costly to consider at this time. As a result, we are currently relying on dry compaction and compaction by traffic. The sampling and analysis of the performance of these compaction methods will be done soon. So far, these methods, similar to ones used in the U.S. on low volume roads seem adequate.

The number of dump trucks could also be productively increased by two or three to keep up with the scrapers. If this measure is not taken the scrapers will have to be used on longer, less economic runs with the corresponding negative impact on timely completion of the final courses. The efficient use of this equipment demands rigorous planning of both construction and equipment maintenance. Detailed network type planning, on-the-job production computations "a la CAT manual" and continuous adjustments, are called for.

Equipment management procedures in this project have the potential to serve as a model for future African roads projects. The typical procedure for equipment procurement and maintenance in such projects has involved the procurement of new equipment. By project's end, the equipment is in disrepair and spareparts stocks are depleted. Local Public Works (PW) crews are expected to use the remains for road maintenance activities.

In sharp contrast to this norm our project has concentrated on procurement of excess property and restoration of used equipment. The equipment inherited from the first 70 km of construction had been pushed to its limits by efforts to complete the road on schedule. Public and private engineers in any developed country would have considered it ready for salvage. However, at a fraction of the cost of new equipment it has been returned to top condition. Proper maintenance and repair will preserve it throughout the life of the project. Such restoration activities have demonstrated to the PW subdivisions methods for taking full advantage of existing materials. The procurement of excess property will reinforce the lesson that proper equipment repair and maintenance makes construction possible at much reduced costs.

This project, if modified and fully funded as proposed, will bequeath mechanics, tools and spareparts, as well as comprehensive systems for procurement and maintenance. This will provide local PW sub-divisions with a real road maintenance capability despite the minimal availability of operating funds.

C. Status of Contract Team

1. Work Site

The worksite at M'Bout and Km 77 are 500 kms from the source of any real amenities. Until recently work was frustrated by a lack of parts and materials. Early on the contractor personnel became convinced that they were being subjected to sub-normal work conditions. Despite their own diligent efforts to maintain high work standards, low morale and persistently difficult field conditions have taken an inevitable toll on their overall performance. AID/W/SER/CM ruled against a contract amendment designed to improve morale by upgrading benefits for the Technical Assistance Field Team. They did, however approve of efforts to boost morale, as long as they fall within the scope of the existing contract.

2. Organization and Planning

The evaluation team found the contractor's organization and planning to be weak. Examples include:

- a. Lax adherence to Mauritania Labor conventions;
- b. Non-existence of jacket files, maintenance files, consumption files, and comprehensive maintenance work plans on each piece of equipment;
- c. Lack of systematic ordering procedures including summary charts, elimination of duplication, stock/inventory systems, systematic preparation of receiving reports, etc. for spare parts and fuel supplies;
- d. Lack of adequate planning documentation upon which to base work and ordering systems;
- e. Inadequate personnel filing system and system for supervision and guidance which in conjunction with jacket files can yield a system for awarding good work and taking corrective action on bad work or abuse;
- f. Lack of cohesive leadership by Chief of Party (COP) and of team work as result of ad hoc/crises management style.

Central office guidance to the COP with respect to the above, was consistently lacking. Nevertheless, it is important to note that the high quality of the contract team and laudable efforts by several Mauritians allowed the project to progress despite the flaws in management systems. Crises were well handled (though not without some scars), equipment was repaired, earth moved and construction begun. In response to the evaluations findings, all weaknesses are currently being addressed.

While the organizational and planning base required for efficient field operations cannot be developed overnight, notable progress has already been made.

3. Reports

The quality of M&M reports has varied significantly. The Project Work Plan and Schedule, (PWP&S) though very well done as far as it went, did not go far enough. AID/Washington guidance, (STATE 83 206726 Addendum) dated 23 July 1983, gives numerous comments which should have been incorporated into PWP&S. Mr. Larson of M&M was informed of these comments during his visits to Mauritania in July 1983 and in January 1984. To date, no revised PWP&S has been received. USAID has been assured that revisions are in process.

Monthly reports have improved somewhat in quality over the course of the project. However, they continue to be based upon the limited planning efforts of the preliminary PWP&S. M&M Central Office guidance was again inadequate. Now these reports are vastly improved and will be of great use to all concerned.

The hydraulic report was an excellent report and the basis for much of our redesign work. Unavoidably, it was done without the benefit of a center line profile. This makes its quality and depth all the more impressive.

4. Training

Structured on-the-job training has been provided for operators and mechanics and is being continued through daily instructive supervision. Training, thus far, has concentrated on operational maintenance and repair actions. It is strongly recommended that organizational requirements be included as part of the curriculum. This is particularly important to counter the exposure of all personnel (inventory/lubricant and fuel, mechanics, operators) to the poor field organization procedures, which have existed in the past and are only now being rectified. The M&M team is encouraged to actively pursue any additional training opportunities which arise during the course of the project. One possibility is providing maintenance training to the personnel of the Public Work Subdivisions. Additional training opportunities may present themselves as the project progresses. The M&M team should actively pursue any opportunities which arise (e.g. maintenance training of sub-division personnel).

5. Construction Contract

Attitude has been an important disruptive factor in this project. In November the M&M team perceived themselves as a construction contractor with the requisite need to fight for every possible concession from the client USAID. Similarly USAID gave as little as possible to the contractor. While such tactics are a normal part of a construction contract, this is a development project in addition to being a contract and the ensuing conflict is in no one's best interest. A more collaborative approach is preferable. The project would benefit by being viewed as a joint venture by M&M, USAID, UNSO/OPE and the Department of Public Works.

6. Implementation Alternatives

We are optimistic that the contractor will solve all management, planning and organizational problems. However we consider it prudent to present alternative methods of implementation, in order to be prepared for any eventuality.

By June 1984, the contractor is expected to:

- a. Complete and assure USAID approval of a comprehensive Equipment Maintenance Plan;
- b. Revise and receive USAID and AID/W approval of the project Work Plan and Schedule; and
- c. Complete a one year detailed Procurement Plan.

If these actions have not been taken, then the following alternatives should be considered:

Alternative A. PSC direct AID project management:

PSC's should be sought by USAID, AFR/TR/ENGR, and REDSO/ENGR to fill the positions of the TA team. USAID would contract directly with them for required work. Some studies (e.g. drainage) would have to be completed by short-term consultants.

Alternative B. An Alternative Firm would be substituted for the present contractor as quickly as possible.

D. Status Of Public Works Contributions

1. GENERAL:

The Directorate of Public Works has been very supportive. An excellent rapport has been developed in terms of holding meetings, obtaining exonerations and processing implementation letters. The minimum tasks to allow the project to exist are accomplished with little difficulty. In addition some very valuable equipment was obtained from PW and the project has been able to borrow other items when necessary. Outside of these activities project implementation proceeds with no regular interaction with the Directorate.

2. Personnel

Some of the detached PW personnel working on the project have proven to be very capable. The work superintendent, for example, would be able to run a heavy equipment maintenance operation if he received literacy and administrative training. In general, PW/Nouakchott personnel have demonstrated little interest in working for the project, or benefitting from project training opportunities. More determined efforts should be made to evoke such interest. In particular, it would be useful to encourage a technical administrator to go to M'Bout both to assist in the project activities and to learn about planning and organization of construction sites. Similarly another topographer would provide useful assistance and benefit from exposure to the project .

The most serious constraint to encouraging PW employees to take part in project activities, is the inability of the GIRM to pay indemnities. Previous agreements with the GIRM prevent USAID from taking over this part of the payment to GIRM personnel. Consequently PW staff are reticent to take field positions. This problem has been partially resolved by detaching PW employees from the Ministry and hiring them by the project. However, most of the PW employees who chose this option were "contractual" workers, as opposed to "fonctionnaires". It is this higher grade of personnel that we now need. It is possible that there are different obstacles blocking this class of worker from joining the project. All such obstacles must be identified and overcome if the project is to accomplish its anticipated training goals.

3. Funds

Public Works funds have not been available. As discussed above even personnel originally on the GIRM payroll have not received salaries from the GIRM. An important in-kind contribution of equipment by PW has constituted a significant saving of project funds.

4. Maintenance

As anyone who has worked on road projects in the Sahel can attest you must never assume that the road you build will be routinely maintained. Even now, in this project it is uncertain whether there will be maintenance funds.

Several actions may be taken at this time to increase the chances of road maintenance after construction is completed. While there is no guaranteed source of maintenance funds available for this road in the foreseeable future, there is some chance that the new World Bank Fourth Highway Maintenance Project will be active in this region. Currently neither PW sub-division has a plan of action for the future use of funds should they become available. We, therefore, conclude, that an essential first step must be the preparation of a comprehensive maintenance plan.

It also important that contact between the TA team and local PW sub-divisions be broadened. This would be beneficial to both groups. The TA team has much expertise to share. The local PW sub-divisions (in contrast to the Nouakchott central) are highly motivated to deal with maintenance problems. After all, they bear the brunt of the criticism from local people. They also have excellent hands-on knowledge of the problems in their own regions.

Unfortunately contact to date has been limited to some maintenance work and borrowing of PW tools and equipment. Closer collaboration could be used to develop work plans and devise imaginative maintenance schemes (eg. using commercial trucks to pull road drags).

In keeping with this latter idea, the PW could follow-up on the Project Paper suggestion that maintenance activities be developed in conjunction with the local population. For instance, at the peak work times which follow rains day-laborers could be hired at the going rate. The specific modalities for the contracting of labor and raising maintenance funds need to be worked out with the various communities located along the road. PW staff might visit some villages to begin to learn 'if' an arrangement is possible. Even if this approach proves untenable, the investigative efforts would have a positive side effect by getting PW personnel into the field.

Y. has worked in Kenya

Local currency funds (PL480, Section 206) could be used to finance post project maintenance activities on the Kaedi-Gouraye road. This option needs to be evaluated by GIRM and USAID.

5. Work Request

Additional work done by the project at the request of the GIRM includes the maintenance and repair of the M'Bout to Km 70 stretch, the maintenance and repair of the Kaedi-M'Bout road and the lengthening of the runway at the Selibaby Airport. The first two actions are part of the project as stated in the ProAg. They also benefited the project by making transportation in the area easier. The runway improvements only took three days and may provide some positive, (though minor) benefits for the project. All three activities promoted good will, which is an important prerequisite for continued collaboration. We do not recommend that reimbursement be sought from the GIRM for M'Bout-Kaedi or Airport work. However the UN will be asked to share (at minimum) in the cost of repair (not maintenance) of the section of road which it built.

*Should include ProAg
economic
Asst. Dir.
included in the final*

The Governor of Selibaby has requested we build a new bridge. This activity is too extensive for us to consider. We do recommend that a study be done to determine what improvements in existing combination bridge/ford are feasible.

6. Ferry Landing at Gouraye

A positive example of local cooperative effort and a significant contribution to our project activities was the completion of a ferry landing at Gouraye. The PW sub-division provided funds and personnel; the local rural works entity provided heavy equipment and the local Governmental Administration coordinated the work.

It is believed that the crossing from Gouraye to Bakel will increase the benefits from the project roads significantly. While the stability of the landing is still in question, it could be easily upgraded. It is important to note the high priority the regional administration must have attached to the ferry crossing to dedicate scarce resources to its construction.

F. STATUS OF PROCUREMENT

1. SMO

The biggest problem with procurement is the lack of a detailed procurement plan. The preparation of this document is the responsibility of the contractor (see contractor status). Though the off-shore procurement by surface has often required a six month lead time, the operation as a whole has been as well managed as any this author has seen in West Africa. The office has been unusually creative its efforts to expedite the procurement of goods and commodity related services within the sometimes rigid limitations of AID Regulations. In addition to the office's adroitness in the field of procurement, its chief's previous experience as mechanic and operator has permitted him to offer much valuable advice on equipment operation and maintenance.

A critical component of the procurement process is a relationship of mutual respect and good communication between the field and the procurement office in Nouakchott. In the past some procurement actions have been taken without the necessary consultations and the tone of some communications have been unduly harsh. For example deletions made by suppliers on requisitions without consulting the TA team have caused much consternation in the field. While some deletions are unavoidable they should always be cleared by the TA team. Constructive criticism and information sharing are essential to the efficient operation of the project.

The customs exonerations obtained by SMO are done with amazing efficiency.

Receiving reports must be requested in a timely manner by Project Management so that SMO can maintain up-to-date records.

It is recommended that the very valuable Summary Charts of Off-shore Procurement should always include Estimated Arrival Dates. This should be done even early in the process, when it is known that they will have to be revised several times. Despite potential future changes the initial estimate remains useful for planning purposes.

UNSO/OPE

Procurement and local fund management by UNSO/OPE has provided indispensable support to the project. The existing system of local procurement in Nouakchott will soon be enhanced by a system for Dakar, which will greatly increase the variety of locally available spares.

Preparation of a summary chart similar to SMO's is a necessary addition. This would keep all concerned up-to-date and avoid having things "slip through the cracks."

Unfortunately the attitude problems affecting M&M/USAID relations have also affected the UNDP/OPE field director, who had the misfortune until recently of being the only radio contact with the field crew. It is hoped that future problems will be both communicated and responded to in a constructive fashion.

F. FINANCIAL STATUS

1. Financial Situation (see Addendum 1 for Summary as of 1984)

The cost per kilometer is currently estimated at US\$56,535 as opposed to the PP calculation of US\$31,143. The change in cost may be attributed to a number of factors including delays in implementation due to damage and subsequent repairs to M'Bout-km 70, increased equipment and spares procurement to improve machine mix and return it to working condition and increased use of technical assistance over PP estimates. It is believed by Project staff that the UNSO model cost/km figure was simply too low to provide an adequate road for the region. What might be saved during construction would most certainly be lost in maintenance costs. Last year's average rainfall caused sufficient damage to show clearly the long-run cost ineffectiveness of this approach. Furthermore M'Bout-Km70 was a less difficult terrain than the other segments, which certainly cannot be constructed at the same cost. Finally, the completion of a high quality hydrological study has provided us with a much more accurate picture of the required drainage structures. It would be foolhardy to ignore these findings and not follow through with the recommended improvements in road specification. For those who are concerned with the sharp increase in cost/km it is useful to compare these figures with that for the Aleg-Roghe road, which cost \$100,000/km. While this road was admittedly of higher than necessary standards, it could in no way be classed as a high standard road. Additionally, it did not require the complexity of drainage work demanded by the Kaedi-Gouraye construction.

Cost estimates for this project are based on a cost/month, with all equipment on line, of approximately US\$262,000/month. Of this, US\$111,000/month is fixed salary costs, US\$4,625/day. Consequently each day on which work cannot be done, and each additional day of implementation costs the project a minimum of US\$4,625.

The critical conclusion coming from the cost analysis is the urgent need for additional funding. We have known for sometime that the PP cost estimates were too low. However, the magnitude of the discrepancy and the rate of funds disbursement have been much greater than anticipated. At the present rate of expenditure virtually all dollar funds will be subobligated by June of this year. This will leave no funds for contingencies. Any imprecision in current cost calculations will not be able to be covered.

If additional PL480 funds are used to reimburse dollar funds and vital drainage structures are not procured (requiring adjustments in the project implementation plan), basic commodity procurement could continue until December with the existing funds. The Project could then continue with local currency, possibly reaching Gouraye by June 1985. This assumes that all cost estimates are adequate and nothing unexpected occurs during implementation. Given the inadequacies of our costing data, a five percent contingency should be considered the minimum acceptable. The USAID engineer believes the figures might vary by as much as 15 percent in either direction.

To complete the road as planned in the PP and to bring the UN road up to minimum road standards will require an addition of US\$5,927,000 to the already available US\$6,509,000. These calculations of the project's costs include neither the GIRM's contribution of heavy equipment (valued at US\$1,800,000) nor the administrative contribution of the UN (value US\$200,000). Within the additional funds requirements it is important to consider the different needs for foreign exchange (FX) and local currency (LC). The LC costs are US\$3,387,000 and could be made available through PL480 funds, if such can be provided in a timely fashion. The remaining US\$2,540,000 must be provided in foreign exchange.

While the timely availability of PL480 funds is possible, past experience suggests it is improbable. An alternative is to use dollar funds deobligated from other projects; or a combination of the two sources. We recommend that all available PL480 funds for this year be applied to the Project to allow time for preparation of the PP supplement and amendment of the Grant Agreement. This would add US\$762,000 to the local currency funds already approved, slightly reducing the total need for additional funds to US\$5,115,000.

2. Financial Management

The financial management of the project has been relatively problem free. Some improvements are being made in the already certified accounting system for local purchases. There has been an ongoing problem involving the method of payment for purchases of critical items in Dakar. (These purchases are considered local). It has been proposed that a UN Bank account be opened in Dakar by advancing US\$4,000. The advance is to be reimbursed upon receipt of payment for project commodities. We recommend that this account be opened ASAP.

G. STATUS USAID PROJECT MONITORING/MANAGEMENT

1. Project Management Information System

The Project Monitoring and Management done by the USAID Project Manager has been more than adequate. We propose that a simple management information system would be a useful addition to the existing system. It would avoid having things fall through the cracks or delayed by crises. Such a system should be set up for the Project Manager himself, the Equipment Specialist, and the Administrative Assistant.

2. Equipment Specialist

The Equipment Specialist has been a key contributor to the progress of the project as a whole. His continual hard work has kept the project moving. Plans he has prepared for equipment and requisition monitoring system should be put in place ASAP.

H. M'BOUT TO KM 70 ROAD

The first seventy kilometers of road from M'Bout toward Selibaby funded by UNSO were constructed by approximately the same workforce as the current project, but with a different TA team and a different philosophy of road construction. No systemized design was done. Instead ridge lines were followed as closely as possible for alignment. Curves are often small radius. Fords were built with no effort to estimate hydraulic characteristics of crossing. As a consequence the road is at times flooded by unchanneled waters. Severe damage occurred during several floods last year, leaving the road impassable at the Gafar crossing for over 60 days.

Several of the fords must be replaced by larger, higher structures be they fords, combo ford/culverts or other. The surfacing material used for much of the road is also inadequate.

If this first road segment is not brought up to the minimum standards required by the local environment it will not be worth continuing our road. The cost of these improvements is approximately U.S.\$ 1,000,000 . Records of the exact costs of repairs should be kept and presented to the UN for possible future reimbursement.

IV. SIGNIFICANT CHANGES FROM PROJECT PAPER EXPECTATIONS

A. Introduction

The fundamental assumption in the PP logical framework was that "Standards selected for improvements of rural roads meet technical, social and economic requirements of the region". The extensive damage suffered by the first segment of the road showed indisputably that the design specifications were not adequate. Our new understanding of the conditions combined with other unexpected changes in inputs (eg. GIRM's contribution) required revisions not only in the technical specifications of the construction but also in the implementation and financial plans. These revisions are now presented to demonstrate the gradual divergence of the existing project from the situation anticipated in the PP.

B. Technical Revisions

The Project Paper technical analysis, above average as far as it went, did not include a center-line profile nor a drainage study. Instead hydrological considerations were based on the experience and judgement of the design engineer. The extensive damage caused last year by average rainfall revealed the inadequacy of the estimates for the design water level, and hence fill and structure specifications. The error in judgement (which was repeated by engineers from the UN, M&M, USAID Mauritania and the M&M hydrological engineer prior to his study) is understandable in light of the completed hydrology and unusual drainage problems. For example a 566 square kilometers drainage basin with a flood flow of 1,105 meters per second and an average flood duration of 12-20 days was discovered. The magnitude of this flooding was unlikely to be predicted, as the main channel is only about five meters deep and 15 meters wide. Flooding had been so general that high water signs were not clearly evident nor was the flood plain easily distinguishable from surrounding terrain. Revised technical specifications, designed to be responsive to current awareness of these drainage problems, include increased embankments, increased provisions for drainage, and a more appropriate mix of heavy equipment.

C. Implementation Plan Revisions

The implementation plan was altered to include:

1. Increased maintenance and procurement activities associated with the restoration of the UN equipment;
2. Reevaluation of the design standards; and
3. Repair work on the damaged road segments, essential to secure access to the Project Sites.

Each of these activities contributed to delays in new road construction. The length of the procurement process had been in general underestimated, particularly for certain makes of equipment (e.g. almost one year for IH major components). Combined with the increased number of procurement actions demanded by the poor condition and inappropriate mix of inherited equipment, this led to significant delays.

The time spent repairing M'Bout to Km 70 diverted resources from their originally scheduled activities. This occupied road crews over a five-month period as flash flooding repeatedly rendered certain wadi crossings impassable.

New road construction was further delayed as drainage structures were reevaluated and plans revised. Revisions required acquisition and repair of additional GIRM equipment to manage newly determined embankment fill quantities. Culvert procurement was also delayed pending reconsideration of the specifications required.

D. Financial Revisions

The most important financial revision is the increased cost/km estimate. The UNSO road was built for U.S \$ 31,143/km. Clearly the savings made by adhering to this standard, have been undone by the high cost of maintaining the segment.

Our revision of the technical specification, greater use of technical assistance (including the important addition of an Equipment Specialist to our team and the use of shorter term TA) and our need for more sophisticated equipment mix to carry out the work have all contributed to an upward revision in costs to U.S. \$56,535/km.

E. Changes in GIRM Contributions

During the course of the project there have been significant changes in the contribution made by the GIRM, both in terms of commodities and participation.

The value of the GIRM's equipment contribution was increased substantially by the addition of two graders, three scrapers and two bulldozers.

In Ministry of Equipment and Transport was unable to maintain the salaries and indemnities of the personnel it had assigned to the project field activities.

The GIRM's ability to maintain the completed segments of the road remains uncertain. The GIRM's fourth Highway Project, supported by the IBRD offers the best prospects for future maintenance.

As a result of these combined revisions the Project now faces a serious shortage of funds. It has become necessary to make a critical decision as to how to proceed. Should the project be terminated when current funds are exhausted? If additional funds are provided should the original plans for a Kaedi-Gouraye road be completed, or are there shorter sections that would be useful and more economical, Section V presents the options, their costs, advantages and disadvantages.

V. OPTIONS FOR FUTURE IMPLEMENTATION

Cost estimates in this section were based on the method used in the Project Work Plan and Schedule and the most up-to-date cost information available. Uncertain drainage requirements and production rates limit these estimates to a 15 percent accuracy level. Below we will analyze each of the possible options for future implementation.

Option A is to terminate the project with existing funds. This will allow the project to complete construction of the road bed from M'Bout-Selibaby (approximately 22 percent of the originally planned construction). In addition to the construction there will be an equipment park of well maintained heavy equipment, vehicles machinery, culverts and the infrastructure needed (camps, maintenance equipments, etc.) to continue road construction.

Option B is to construct one or a combination of segments of the road, without completing the entire road from Kaedi to Gouraye. Possibilities and their respective costs are:

(1) M'Bout - Selibaby. Additional cost \$.8 million

(2) M'Bout - Selibaby - Gouraye. Additional cost \$ 2.8 million. If no additional dollars are made available, this option could proceed with an additional equivalent of US \$2,000,000 in PL480 generated funds. This would assume no imprecision in cost estimates and no offshore procurement of spares after December 1984.

(3) M'Bout - Kaedi; M'Bout - Selibaby. Additional cost \$ 4.5 million.

Each of these sub-options has its own set of advantages and disadvantages.

(1) M'Bout to Selibaby:

Advantages.

- a. Limited cost increase; and
- b. No additional project supplement.

Disadvantages.

a. Would not satisfy any of original project outputs or purpose;

b. Despite the Grant Agreement standard clause that GIRM will cover cost overruns, termination of the project at Selibaby will give the GIRM the impression that USAID has not fulfilled its commitment. Renegotiation of the Grant Agreement would be onerous at best;

c. The work completed would be almost useless----a road in the middle of nowhere;

d. There would not be sufficient time to refurbish equipment for subsequent GIRM use; and

e. Again, due to the time constraints, training would be very limited.

(2) M'Bout - Selibaby - Gouraye

Advantages.

a. If Gouraye is reached an economically viable road link will have been established, i.e., project outputs and purpose will have been partially addressed;

b. Possibility of US dollar Grant cost increase; and

c. Limited additional project supplement work.

Disadvantages.

a. Timing of generation and delivery of PL 480 funds is uncertain;

b. Would not satisfy all project outputs;

c. US would leave impression of defaulting on its commitment;

d. Equipment would be left in unusable condition; and

e. Training would be very limited. Some negative lessons might be learned as equipment is abused in attempt to complete the job on time.

3. Kaedi - M'Bout - Selibaby

Advantages.

a. Selibaby would be linked with Kaedi;

b. Most outputs and part of Project Purpose would be met;

c. Roads would be of high standards;

d. Equipment will be left in good working condition; and

e. Training will have accomplished much of its purpose.

Disadvantages.

a. Does not satisfy all outputs nor entire purpose;

b. USAID would leave impression of defaulting on commitments;

c. Richest rainfall area of all Mauritanian would be left isolated;

d. Economic benefits from ferry at Gouraye would not be realized; and

e. Expenses would almost equal these of option C (our preference).

Option C: Complete road as originally specified in the project paper with the improved engineering standards. The additional cost for this option would be \$5.9 million, based on a specific design standard for the road and drainage structures.

Advantages.

a. All outputs and entire Purpose of Project can be satisfied;

b. USAID will have honored its commitment (plus some);

c. Relationship with the Ministry of Equipment and Transport would be strengthened;

d. The roads would be of a standard which would serve as a model for future use;.

e. The equipment will be in good working condition giving the GIRM and other donors an example of what can be accomplished with older equipment. The cost analysis of this equipment management system will be available for-future reference; and

f. Project training activities would be completed, leaving a core of qualified personnel capable of performing a significant portion of the necessary maintenance activities.

Disadvantages.

a. The cost increase is very large; and

b. Much additional project supplement work will be required to prepare the PP supplement, authorization, Grant Agreement Amendment, etc.

FINANCIAL IMPLEMENTATION SUMMARY (000'S DOLLARS)

	Proj. No. 0214 - Budget			PL 480 (March 1, 1984)		Grant as of May 9, 1984		Completion of Road as Originally Planned		
	PL 480	Grant	Total	Earmarkings	Accrued Expenditures	Earmarkings	Accrued Expenditures	PL 480 Equiv.	Grant Funds	Total
Tech. Assistance	0	\$1,561	\$535	0	0	\$1,431	\$557	0	\$636	\$636
Commodities	0	2,626	2,626	0	0	1,707	646	0	1,379	1,379
POL	0	85	85	0	0	106	39	0	0	0
Local Costs	\$1,699	433	2,132	\$1,699	\$667	433	431	\$762	1,791	2,553
Socio. Econ. Eva.	0	60	60	0	0	0	0	0	0	0
Contingencies	0	45	45	0	0	12	7	0	80	80
Imprecision	0	0	0	0	0	0	0	0		
<u>Totals</u>	<u>\$1,699</u>	<u>\$4,810</u>	<u>\$6,509</u>	<u>\$1,699</u>	<u>\$667</u>	<u>\$3,789</u>	<u>\$1,680</u>	<u>\$762</u>	<u>\$5,165</u>	<u>\$5,927</u>

HEAVY METALS

HEAVY METALS IN RURAL ROADS IMPROVEMENT PROJECT #682-0214

COST ANALYSIS

SUMMARY FINANCIAL IMPLEMENTATION PLAN

PROJECT ITEMS	BUDGET FID 0214-S	ACCUMULATED PRO. COSTS 2/27/84	MONTHLY ACCUMULATED PRO. COSTS	LUMP SUM REQUIREMENTS	ESTIMATED ACCUMULATED PRO. COSTS 5/31/84	DITTO 8/31/84	DITTO 11/30/84	DITTO 2/28/85	DITTO 5/31/85	DITTO 2/28/86	OPTION 2		OPTION 3	
											Minimum	Maximum	Change in Budget for Total Project	Change in Budget for Total Project
PERSONNEL ASSISTANT	15,000	5,000.0	6,000	3,000	7,000.00	9,500.00	11,600.00	13,800.00	15,900.00	21,200.00	10,000.00	10,000.00	10,000.00	10,000.00
MAIL	134,000	48,000.00	6,000	30,000	60,000.00	83,000.00	102,000.00	121,000.00	139,000.00	193,000.00	137,000.00	137,000.00	137,000.00	137,000.00
EQUIPMENT SPECIALIST	21,500	3,500	8,000	0	8,000.00	12,300.00	14,700.00	17,100.00	19,500.00	26,700.00	19,500.00	19,500.00	19,500.00	19,500.00
COMMODITIES	262,600	211,700	37,000	1,000,000	241,700	333,400	345,000	351,000	367,200	466,500	345,000	345,000	345,000	345,000
DRAINAGE RIGHTS		650,000	0	8,810,000	7,200.00	153,100.00	171,000.00	153,100.00	153,100.00	153,100.00	153,100.00	153,100.00	153,100.00	153,100.00
EQUIP/SPARE/TOOLS		146,700	37,000	11,900.00	169,700.00	180,800.00	171,900.00	2,030,000.00	2,141,000.00	2,474,000.00	1,936,000.00	1,936,000.00	1,936,000.00	1,936,000.00
TOL	95,000	32,000	0	48,000	25,000	55,000	55,000	85,000	85,000	85,000	55,000	55,000	55,000	55,000
TOTAL COST	2,172,000	810,000	115,000	1,107,000	1,827,000	2,279,000	2,716,000	3,132,000	3,505,000	4,685,000	3,478,000	3,478,000	3,478,000	3,478,000
PERSONNEL (see items)	500,000	303,000	43,000	3,000	435,000	583,000	693,000	822,000	951,000	1,338,000	951,000	951,000	951,000	951,000
Local Travel	150,000	50,000	1,000	0	50,000	110,000	130,000	150,000	170,000	270,000	170,000	170,000	170,000	170,000
Vehicle Maint	32,000	22,000	4,000	0	34,000	46,000	50,000	70,000	82,000	115,000	82,000	82,000	82,000	82,000
POL	327,000	1,184,000	450,000	0	3,170,000	4,547,000	5,290,000	7,730,000	8,590,000	12,640,000	8,590,000	8,590,000	8,590,000	8,590,000
Mach & Eqmt	589,000	1,637,000	50,000	411,000	598,000	672,000	646,000	670,000	674,000	764,000	674,000	674,000	674,000	674,000
Bldg & Struct	290,000	240,000	1,000	0	270,000	300,000	330,000	360,000	390,000	480,000	390,000	390,000	390,000	390,000
Mat'l & Suppl (Admin)	200,000	50,000	1,000	0	50,000	110,000	140,000	170,000	200,000	290,000	200,000	200,000	200,000	200,000
Mat'l & Suppl (Tech)	128,000	300,000	1,000	529,000	128,000	231,000	329,000	467,000	445,000	583,000	445,000	445,000	445,000	445,000
Freight	14,000	9,000	2,000	0	10,000	11,000	12,000	13,000	14,000	17,000	14,000	14,000	14,000	14,000
Workshop	157,000	63,000	N/A	89,000	147,000	147,000	147,000	147,000	147,000	147,000	147,000	147,000	147,000	147,000
Well Constr.	20,000	0	N/A	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000
Contingencies	210,000	0	70,000	0	210,000	42,000	63,000	84,000	105,000	168,000	105,000	105,000	105,000	105,000
Spares & Supplies (DASH)	75,000	20,000	4,000	0	11,000	26,000	38,000	50,000	62,000	98,000	62,000	62,000	62,000	62,000
SOLO ECON EVALUATION	60,000	0	0	60,000	70,000	30,000	30,000	30,000	30,000	60,000	30,000	30,000	30,000	30,000
CONTINGENT (10%)	47,000	50,000	5,000	0	7,600	35,000	50,000	65,000	80,000	127,000	65,000	65,000	65,000	65,000
IMPRECISION	0	0	37,000	39,100	34,000	574,000	707,000	835,000	970,000	1,279,000	835,000	835,000	835,000	835,000
TOTAL	2,172,000	810,000	115,000	1,107,000	1,827,000	2,279,000	2,716,000	3,132,000	3,505,000	4,685,000	3,478,000	3,478,000	3,478,000	3,478,000

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23 July 83

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E.C. 12356: N/A
TAGS:
SUBJECT: MAURITANIA RURAL ROADS PROJECT 682-0214
PROJECT WORK PLAN AND SCHEDULE

REF: STATE 169782

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ANSWER	

1. A REVIEW OF SUBJECT PROJECT WORK PLAN AND SCHEDULE
TFWP/S, RESULTED IN THE FOLLOWING COMMENTS:

--A. THE ORIGINAL CONCEPT FOR THE PWP/S WAS TO PROVIDE
AN OVERALL PLAN FOR EXECUTION OF THE PROJECT. HOPEFULLY
IT WOULD SHOW HOW THE DIFFERENT ELEMENTS INTERFACED, THE
DEPENDENT FACTORS INCLUDING UNKNOWN, I.E.G. LOCATIONS OF
SURFACE MATERIAL, AVAILABILITY OF WATER, ETC.; LEVEL OF
WORK FORCE; WHEN MAJOR ORDERS FOR SUPPLIES AND MATERIALS
WOULD BE MADE AND WHEN THEY WOULD BE ON THE JOB. THE
PWP/S WOULD BE SUBJECT TO UPDATING (DEPENDING ON CHANGED
CIRCUMSTANCES OR CONDITIONS) BUT WOULD BE THE BASIC PLAN
INTEGRATING ALL THE KNOWN FACTORS WHICH WOULD EFFECT
THE EXECUTION AND PROGRESS OF THE PROJECT.

--B. PRELIMINARY CONSTRUCTION WORK SCHEDULE

----(1) TABLE 1 PROVIDES A BAR CHART SHOWING ESTIMATED
DURATION AND TIMES OF MAJOR CONSTRUCTION ACTIVITIES.
HOWEVER IT DOES NOT SHOW THE INTERRELATION OF EVENTS AND
ACTIVITIES.

----(2) THE NARRATIVE GIVES SOME OF THE ASSUMPTIONS
THAT WERE USED IN DEVELOPING TABLE 1, HOWEVER NEITHER
THE TABLE NOR NARRATIVE REFLECT THE IMPACT OF THE
UNCERTAINTIES. I.E.G. SOURCE OF MATERIALS AND WATER..

----(3) THE ESTIMATED LOCAL EXPENDITURES IN OUGUIYAS IS
GIVEN ON PAGE 24. IT DOES NOT BREAK IT DOWN INTO
MAINTENANCE, CONSTRUCTION, TRAINING OF SUPPORT COSTS.

----(4) THE ESTIMATED OFFSHORE EXPENDITURES IN DOLLARS
IS GIVEN ON PAGE 27. AGAIN IT WOULD BE HELPFUL IF THE
EXPENDITURES WERE BROKE DOWN INTO COMPONENTS, OILS,
PARTS AND LUBRICANTS.

UNCLASSIFIED

----(1) A VERBAL OUTLINE OF THE TRAINING PLAN IS GIVEN ON PAGE 12 AND 13. THE PROPOSED WORK SCHEDULE INDICATES COST. INDICATION SHOULD BE GIVEN THE DECISION ON FORMAL CLASSROOM TRAINING WILL BE MADE IN ORDER TO SCHEDULE TDY ASSISTANCE AND TRAINING AIDS.

----(2) IT WOULD ALSO BE HELPFUL TO HAVE THE ESTIMATED COST OF THE TRAINING - BOTH FOR LOCAL COSTS (STUDENT SALARIES), CONTRACT COSTS (TRAINERS) AND TRAINING AIDS.

----(3) ALSO SEE CONTRACT PARA E1.21E PART 11 TRAINING PLAN

--D. DESIGN AND INSPECTION SCHEDULE

----(1) AGAIN IT WOULD BE HELPFUL TO HAVE THE COST OF THESE FUNCTIONS ESTIMATED.

----(2) WHAT TESTS WILL BE MADE? E.G. COMPACTION, PERCENT, WATER CONTENT, INVERT ELEVATIONS OF STRUCTURES CHECKED, ROADWAY WIDTH, ETC.

----(3) NOTWITHSTANDING PARAGRAPH 6 PAGE 4 OF PRELIMINARY REPORT SEE CONTRACT PARAGRAPHS E1.21 D2 AND PARAGRAPH E1.22C REGARDING DRAINAGE STRUCTURES. -

--E. IT WOULD BE HELPFUL IF THE EXPENDITURES ALSO WERE EXPRESSED IN GRAPHIC FORM BY MONTH AND TOTAL PROJECT (S CURVE).

2. SUGGEST THE PROJECT BE BROKEN DOWN BY MAJOR TASKS AND THE SUB ACTIVITIES THAT COMPRISE THE MAJOR TASK. THEN THE MAJOR TASK BE GIVEN A PERCENTAGE WEIGHT OF THE TOTAL PROJECT AND THE SUB ACTIVITIES BE GIVEN A PERCENTAGE WEIGHT OF THE MAJOR TASK. THE PERCENTAGES MAY BE WEIGHTED IN EITHER PHYSICAL OR MONETARY TERMS. THESE FIGURES SHOULD BE GIVEN COLUMNAR FORM. THE PROPOSED CONSTRUCTION SCHEDULE AND WORK SCHEDULE CAN BE PRESENTED ON THE RIGHT HAND SIDE OF THE SHEET IN BAR CHART FORM AND THE 'S' CURVE OVERLAID ON THE SAME GRAPH. WITH THIS TYPE OF PWP/S THE SCHEDULE AND WORK PLAN CAN BE REVISED AS EXPERIENCE DICTATES.

3. THE PRELIMINARY PWP/S REPORT IS A BEGINNING AND THE NEXT EDITION OF THE REPORT SHOULD INCORPORATE THE ABOVE COMMENTS. THE PWP/S REPORT SHOULD INDICATE WHEN COMMODITIES, SUPPLIES AND EQUIPMENT ARE SCHEDULED TO BE ORDERED AND WHEN ARRIVAL ON THE PROJECT IS EXPECTED. SHULTZ

UNCLASSIFIED

STATE 222710

TRANSLATION

Islamic Republic of Mauritania
Rural Roads Improvement Project
No. 682-0214
s/c USAID
I.P. 206
Nouakchott (RIM)

Best Available Document

Technical and Financial Implementation
Program Document

Transfer Authorization No. 682-XXY-000-

GENERAL:

The purpose of this program document is to specify the conditions under which the local currency (Ouguiya) proceeds from the sales of U.S. PL 480 Program Section 206 food aid provided through Commission for Food Security (CSA) are used for the Rural Roads Improvement sub-project of the 206 program.

A bank account has been opened in the name of the project (AID No. 682-0214). This account is managed by the UNSO/OPE Coordinator who shares joint responsibility with USAID Project Officer for all local Project expenses.

This account can be, upon request, examined and audited by official representatives of the Government of the Islamic Republic of Mauritania and the Government of the United States of America.

The USAID Controller verifies the state of the account at the end of each quarter, at a minimum; external financial reports relative to expended funds (by budget category or sub-section) are furnished each quarter by the Office of the UNSO/OPE Coordinator.

These funds will be deposited by the CSA to the account to be used in the budget categories as specified in the Technical and Financial Implementation Program Document (PETF).

Nevertheless, we must note that while waiting for the funds to be deposited by the CSA, it has been necessary to make payment on an exceptional and provisional basis from this account using dollar funds (normally reserved for exterior purchases). These payments are for local expenses which should have been made exclusively using these U.S. food aid sales proceeds. The dollar funds account, temporarily used to allow work to progress, must be reimbursed to the level of this expenditure.* This must be accomplished by withdrawing a corresponding amount of funds from the Rural Roads Project local currency account to reimburse U.S. dollar account, when adequate deposits have been made.

* If no further dollar funds are forthcoming and upon written agreement of

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During the time this reimbursement is being accomplished, there is a total flexibility between FETF budget subdivisions. For example, a given FETF budget subdivision for POL may be \$100,000. However, there may already be dollars spent for POL to satisfy this need but inadequate sale proceeds yet made available to reimburse the dollar and keep the project going. In such a case, the \$100,000 will be used to advance funds to other line items until the additional sales proceeds become available. The subdivisions in the sub-project budget for sale proceeds will not be exceeded or reduced by more than 15% which is an allowable flexibility among subdivisions.

The overall budget categories, or subdivisions, in the Rural Roads Improvement Project (682-0214) are itemized as follows:

1. PERSONNEL - SALARIES AND RELATED COSTS INCLUDING:
 - a. Specialized personnel hired by the project;
 - b. Unskilled laborers employed at the work site;
 - c. The administrative assistant to the USAID Engineer;
 - d. Selected local-hire procurement and warehouse personnel essential to the movement of commodities to the Project, from the USAID Procurement Office;
 - e. Other personnel as may be mutually agreed upon by the Mauritanian Government and USAID to keep the Project on course.

2. LOCAL TRAVEL AND PER DIEMS INCLUDING:
 - a. Purchase of airline tickets from Nouakchott to the worksite whenever necessary, or to Dakar to conclude urgent commodity purchases;
 - b. Purchase of places on local ground transportation; and
 - c. Other jointly agreed upon travel costs not covered by other funds.

3. VEHICLES - MAINTENANCE AND REPAIRS INCLUDING:
 - a. Procurement of spare parts; and
 - b. Costs for all local services and work necessary for the maintenance of the Project's light vehicles.

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4. PETROLEUM PRODUCTS (POL) INCLUDING:

- a. Various fuels (Gasoline, Diesel);
- b. Oils (motor, hydraulic, brake, etc.);
- c. Lubricants;
- d. Miscellaneous (radiator coolants, motor treatments, penetration oils, etc.); and
- e. In-country transportation of fuels.

5. MACHINES AND EQUIPMENT - MAINTENANCE, REPAIRS AND PURCHASES INCLUDING:

- a. Overhaul of engines on equipment provided to the project by the GIRM: three (3) scrapers, two (2) graders, two (2) bulldozers;
- b. Spare parts for the above (CAT);
- c. Various spare parts for other heavy equipment;
- d. Three new "MACK" Dump Trucks available at Nouakchott and similar to those of the project (if agreed to be necessary by the GIRM and USAID); and
- e. Two new small pick-up trucks available at Nouakchott.

6. CONSTRUCTION AND STRUCTURES - MAINTENANCE, REPAIRS AND MINOR WORK IN PROGRESS INCLUDING:

The purchase of (1) materials for construction or repairs, including minor maintenance of housing units at camps, and (2) supplies required by the construction contracts.

7. OFFICE SUPPLIES AND FURNISHINGS - ADMINISTRATION

8. TECHNICAL MATERIALS AND SUPPLIES INCLUDING:

- a. Equipment and technical materials for matters of topography, design, laboratories, etc.; and
- b. Materials for project drainage structures, particularly cement, reinforcing bar, wood for forms, sabbons, culverts, etc.

9. FREIGHT INCLUDING:

Freight charges for transportation of materials and commodities excepting fuels (see 5 above).

10. CONSTRUCTION CONTRACT FOR A REPAIR GARAGE IN M'BOUT

11. CONSTRUCTION OF SHALLOW OR DEEP WELLS INCLUDING:

The cost of shallow, hand-dug or deep well construction (a function of local hydro-geological conditions) and equipment required for that construction sufficient only to meet the water.

12. CONTINGENCIES

13. IMPRECISION

BUDGET FOR TRANSFER AUTHORIZATION NO. 687-XXX-000.

The budget for this specific transfer is provided in Attachment A.

Details of this budget may be examined at the Office of the Engineer, USAID.

Coûts locaux administrés par UNISO
 Projet No. 682-0214
 Amélioration des Routes Rurales
 Autorisation du Transfer No.
 682-XXX-000- 3616

Pièce Joint (A

Budget Semestriel
 (en milliers d'Ouguiyas)

<u>O b j e t</u>	<u>Besoins Immediats</u>	<u>Besoins Mensuels</u>	<u>Besoins pour le Semestre</u>	<u>Budget Total PEFT</u>	<u>Budget Provisoire Global du Projet dans son ensemble</u>
Personnel - Salaires et Coût s'v reportant	15.150 UM	2.150 UM	28.050 UM	28.050 UM	66,250 UM
Deplacements locaux	250	50	550	250	1.450
Vehicule: entretien et reparations	1.100	200	2.300	1.100	5.900
Produits Petroliers	5.950	2.250	19.450	15.412	63.200
Machines et equipement entretien, reparations et achat	(-1850)	400	21.100	21.100	38.300
		+20,550 (forfaitaire)			
Construction et structures entretien reparations et petite construction	1.200	50	1.500	1.500	2.400
Matériels et fournitures bureau et administration	250	50	550	550	1.460
Matériels et fournitures techniques	1.500	50	9.750	6.600	29.150
		+7.950 (Forfaitaire)			
Fret	450	17	552	450	850
Construction d'un Atelier	0	N/A	0	0	7.350
Construction d'un puit ou forage	0	N/A	0	0	4.000
Imprevus	0	350	2.100	0	8.400
Imprecisions	0	1.050	6.300	0	25.600
TOTAUX (Milliers d'Ouguiyas)	24.000 UM	6.617 UM	92.202 UM	75.012 UM	254.300 UM
TOTAUX (Milliers de dollars)	\$480	\$132.0	\$1844	\$1,500	\$5,086.0
		+28.500 UM(Forfaitaire)			
		+570 (Forfaitaire)			

54

Coûts locaux administrés par UNSO
 Projet No. 682-0214
 Amélioration des Routes Rurales
 Autorisation du Transfer No.
 682-XXX-000-2515 Amendement No. 1

Pièce jointe (A)

Budget Semestriel
 (en milliers d'Ouguiyas)

<u>O b j e t</u>	<u>Besoins Immediats</u>	<u>Besoins Mensuels</u>	<u>Besoins pour le Semestre</u>	<u>Budget Total PEFT</u>	<u>Budget Provisoire Global du Projet dans son ensemble</u>
Personnel - Salaires et Coûts s'y rapportant	15.150 UM	2.150 UM	28.050 UM	0 UM	66.250 UM
Déplacements locaux	250	50	550	0	1.450
Véhicules: entretien et réparations	1.100	200	2.300	0	5.900
Produits Pétroliers	9.200	2.250	22.700	3.250	63.200
Machines et équipement entretien, réparations et achat	8.150	400	31.100	10.000	38.300
		+20.550 (forfaitaire)			
Construction et structures entretien réparations et petite construction	1.200	50	1.500	0	2.400
Matériels et fournitures bureau et administration	250	50	550	0	1.460
Matériels et fournitures techniques	1.500	50	9750	0	20.150
Fret	450	+7.950 (forfaitaire)			
		17	552	0	850
Construction d'un Atelier	4.700	2.650 (forfaitaire)	7.350	7.350	7.350
Construction d'un puit ou forage	0	4.000 (forfaitaire)	4.000	4.000	4.000
Imprévus	0	350	2.100	0	8.400
Imprecisions	0	1.050	6.300	0	25.600
TOTAUX (Milliers d'Ouguiyas)	41.950 UM	6.617 UM	16802 UM	24.600 UM	254.300 UM
TOTAUX (Milliers de dollars)	\$839	+35.150 UM (forfaitaire)			
		\$132	\$2336	\$492	\$5.086
		\$703 (forfaitaire)			

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UNCLASSIFIED

NOUAKCHOTT 21712

VZCZCMT *
PP RUEHC
IE RUFHC #1712/31 128 **
ZNR UUUUU ZZH
P 171200Z APR 84
FM AMEMBASSY NOUAKCHOTT

CLASS: UNCLASSIFIED
CHRG: AID 4/11/84
APPR: AID/DIR:DMILLE
DPRD: ENGR:GTEOMPSON
CLFR: SA/DIR:REGOLEMI
DISTR: AID-5 AMP DCM
ECON CERON

~~UNCLAS SECTION 21 OF # NOUAKCHOTT 21712~~

AIDAC-

FOR: AFR/SWA, AFR/PE/SWAP, AFR/TR/ENGR

E.O. 12356: N/A

SUBJECT: MAURITANIA RURAL ROADS PROJECT (622-2214) PP
SUPPLEMENT

REF: (A) STAFF 221114, (F) NOUAKCHOTT 03445, (C)
NOUAKCHOTT 1341 (D) NOUAKCHOTT 2711, (E) 22
22297

1. SUMMARY: THIS CABLE SUMMARIZES THE MAJOR FEATURES OF THE RECENT IN-PCNSE RURAL ROADS PROJECT EVALUATION AND SETS OUT STRATEGY FOR THE PREPARATION OF THE PP SUPPLEMENT REQUIRED FOR THE ACHIEVEMENT OF ORIGINALLY ANTICIPATED PROJECT OUTPUTS. REFEELS (C,D) ON PERSONNEL HAVE BEEN SENT CONCERNING THE ISSUE OF THERE BEING NO DE ENGINEER OR MISSION PROJECT MANAGER AT POST AND THE ISSUE CONCERNING THE LACK OF A CONTRACTOR COP. IN ESSENCE, USAID'S INTERNAL EVALUATION CONFIRMED THE FOLLOWING MAJOR POINTS:

- A) THE UNSC LOW COST ROAD BUILDING MODEL HAS NOT WORKED IN THE PROJECT AREA.
- B) THERE WERE GOOD HISTORICAL REASONS FOR THE FACT THAT A NUMBER OF IMPORTANT ASSUMPTIONS ON WHICH THE DESIGN OF THIS PROJECT WAS BASED PROVED INCORRECT.
- C) CORRECTIVE ACTIONS TAKEN TO DATE VIS-A-VIS CONSTRUCTION DESIGN, EQUIPMENT MIX, ETC. WERE APPROPRIATE.
- D) THESE ACTIONS ALMOST DOUBLE THE COST OF THE ORIGINAL PROJECT.
- E) THE CONTRACTOR AND THE MISSION HAVE DONE AN EXCELLENT JOB IN ADAPTING TO UNFORESEEN CONDITIONS AND IMPLEMENTATION IS NOW PROCEEDING WELL.
- F) THE KARRI-M'BOUM-SILIBABY-GOMPAYE ROAD IS A PREREQUISITE TO REAL DEVELOPMENT IN MAURITANIA'S MAJOR AGRICULTURAL REGION - THE SENEGAL RIVER BASIN.
- G) THE PROJECT AS ORIGINALLY DEFINED SHOULD BE COMPLETED AND THE REQUIRED FUNDS OF \$5.9 MILLION ADDED.

USAID REQUESTS AID/W REVIEW OF EVALUATION AND PROPOSED TECHNICAL AND FINANCIAL SUPPLEMENTS TO PP CONTAINED IN THE EVALUATION. MISSION REQUESTS AID/W GUIDANCE ON PROCEDURES

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REQUIRED TO SUPPLEMENT PP AND AMEND AUTHORIZATION WITH THE
 OBJECTIVE OF OBLIGATING ADDITIONAL FUNDS PRIOR TO
 SEPTEMBER 1984 IF THE PROJECT IMPLEMENTATION SCHEDULE IS
 TO BE MAINTAINED. END SUMMARY.

2. THE HISTORY OF THIS PROJECT EXPLAINS MANY OF THE
 CIRCUMSTANCES THAT SURROUND ITS CURRENT IMPLEMENTATION
 PLAN AND THE FACT THAT PROJECT FACES A COST INCREASE LARGE
 IN PROPORTIONS IF NOT IN ABSOLUTE MAGNITUDE.

A) THE DESIGN ASSUMED THAT THE UNSO DESIGN WOULD WORK. IT
 DID NOT. THE UNSO/OPE MODEL FOR RURAL ROAD CONSTRUCTION,
 WHICH HAS BEEN APPLIED IN OTHER COUNTRIES WITH MIXED
 RESULTS, HAS PROVEN INAPPROPRIATE HERE. IT PROVED
 INADEQUATE EVEN FOR THE LESS DIFFICULT TERRAIN OVER WHICH
 UNSO/OPE DESIGNED AND MANAGED THE CONSTRUCTION OF THE
 FIRST 73 KM FROM M'BOU TOWARD SELIBAY. NEITHER DESIGN
 NOR CONSTRUCTION ON THIS SEGMENT IS OF SUFFICIENT QUALITY.
 AID'S DESIGN, IN TURN, ASSUMED THAT THE UN EQUIPMENT MIX
 WAS CORRECT AND THAT THE EQUIPMENT INHERITED FROM THE
 FIRST PHASE UN EFFORT WOULD, AFTER ONE YEAR, BE WELL
 MAINTAINED AND READY TO GO. THE EQUIPMENT WAS IN POOR
 SHAPE, NOT READY FOR USE, AND THE MIX WAS NOT APPROPRIATE.
 OUR ASSUMPTIONS WERE WRONG, OUR CONFIDENCE MISPLACED.
 DOLLARS 38,225 PER KM PROVED TO BE TOO LOW IN THE
 DIFFICULT TERRAIN OF GORGOL.

B) THE PROJECT ASSUMED THAT THE UN ROAD WOULD BE COMPLETE
 -- A FINISHED PRODUCT. LAST YEAR'S RAINS WASHED OUT LARGE
 PORTIONS OF THE ROAD AND SHOWED THAT THE DESIGN OF THE
 DRAINAGE STRUCTURES ON THE UN ROAD WAS NOT ADEQUATE. IT
 WILL COST APPROXIMATELY ONE MILLION DOLLARS TO BRING THE
 UN SEGMENT OF THE ROAD UP TO A MINIMUM STANDARD FOR ALL-
 WEATHER GRAVEL ROADS.

C) THE DESIGN SUGGESTED THAT CONTINUATION OF THE UNSO
 MODIFIED FORCE ACCOUNT PROCEDURE OF CONSTRUCTION WAS A
 GOOD ONE. THIS ASSUMPTION INFLUENCED OUR PROGRAMMING THE
 ROAD PROJECT AT THE ALTOGETHER TOO-LOW FIGURE OF SIX
 MILLION DOLLARS. THIS AMOUNT WAS ULTIMATELY AUTHORIZED
 WHICH THEN RULED OUT ANY POSSIBILITY OF USING A
 CONSTRUCTION CONTRACTOR. IT TURNED OUT THAT THE UN HAD
 CONSIDERABLE PROBLEMS WITH ITS CONTRACTOR. THE FINAL
 KILOMETERS OF THE ROAD WERE CONSTRUCTED WITHOUT AN
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ENGINEER ON SITE AND THEIR PROJECT (C-173) SUFFERED AS A RESULT.

1) THE AID TEAM HAS MADE MANY ADJUSTMENTS TO THE BASIC DESIGN OF THE PROJECT TO OVERCOME THE ERRONEOUS ASSUMPTIONS MADE IN THE DESIGN OF BOTH THE UN AND THE AID PROJECTS. THESE CORRECTIONS WERE NECESSARY IF WE WERE TO AVOID THE DISASTER OF A MAJOR "UNDER-DESIGN". BUT THE REMEDY HAS A COST, A COST WE MUST ABSORB SINCE IMPROVEMENT TO AND CONSTRUCTION OF EACH OF THE ROAD SEGMENTS IDENTIFIED IN THE PROJECT ARE AN ESSENTIAL PREREQUISITE FOR AGRICULTURAL DEVELOPMENT IN THE AREA.

3. AS OF NOW, THE PROJECT CANNOT ACHIEVE THE OUTPUTS, PURPOSE, OR GOAL WITHOUT MAJOR OPERATIONAL/CONSTRUCTION MODIFICATIONS TO BENEFIT FROM THE EXPERIENCE WITH THE UNSO MODEL WHICH SHOWS THAT:

A) ESTIMATES OF DRAINAGE REQUIREMENTS (BOTH STRUCTURES AND EMBANKMENTS) WERE MUCH TOO LOW;

B) ESTIMATES OF SPARE PARTS REQUIREMENTS, OPTIMISTICALLY BASED UPON WHAT WAS ASSUMED TO BE LOW MILEAGE USED EQUIPMENT, WERE FAR TOO LOW; AND

C) ESTIMATES OF THE TIME REQUIRED TO EXECUTE PROJECT TASKS WERE TOO SHORT (AS A RESULT OF THE POOR EQUIPMENT MIX AND UNREALISTIC OPTIMISM CONCERNING WEATHER AND LEAD TIMES. AN ADDITIONAL NINE MONTHS IS NOW ESTIMATED FOR COMPLETION OF ALL ROAD SEGMENTS AS PLANNED). APPROXIMATELY U.S. DOLS 5.9 MILLION IN ADDITIONAL AID SUPPORT IS NOW ESTIMATED TO BE NEEDED FOR COMPLETION OF THE PROPOSED CONSTRUCTION. THE ADDITIONAL FUNDING WILL ALLOW THE COMPLETION OF THE THREE ROAD SEGMENTS AS PER THE PROJECT PAPER AND OUR PROJECT AGREEMENT WITH GIRM. IT WILL ALSO FINANCE THE REHABILITATION OF THE UNSO CONSTRUCTED SEGMENT (M'ECOUT - 173). THUS THE ROAD PROJECT WILL CONSIST OF THE CONSTRUCTION OF AN ALL WEATHER GRAVEL ROAD BUILT TO PROPER ENGINEERING STANDARDS FOR THE LOCAL CONDITIONS. COMPONENTS OF THE KAEDE TO GOURAYE ROAD PROJECT ARE :

KAEDE TO GOURAYE	370
KAEDE TO M'ECOUT	115
M'ECOUT TO 173	70
173 TO SELIBABY	45
SELIBABY TO GOURAYE	45

-----370

THE DOLS 5.9 MILLION IS BROKEN DOWN AS FX DOLS 2.3 MILLION AND LC 3.6 MILLION. THE PAGE SHOULD BE CHANGED FROM 12/85 TO 6/87 TO ACCOMMODATE CHANGES IN THE CONSTRUCTION SCHEDULE.

4. CURRENT PROJECT STATUS AND MAJOR ACTIONS TAKEN TO IMPROVE PROJECT IMPLEMENTATION ARE LISTED BELOW:

----A. BRIGADE EQUIPMENT MIX CHANGED AND EQUIPMENT ADDED. THE MAJOR CHANGE WAS THE ADDITION OF SCRAPERS WHICH WERE NOT PART OF THE UNSO BRIGADE.

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----B. EQUIPMENT REPAIR SHOP BUILT AT M'ECOUT TO FACILITATE ON-SITE REPAIR AND FOR FUTURE ROAD MAINTENANCE ACTIVITIES. GIRM CONTRIBUTED 25 MILLION UM (FROM FY 81, PL 422, SECTION 226 COUNTERPART FUNDS) FOR WORKSHOP AND OTHER UNANTICIPATED LOCAL COST REQUIREMENTS.

----C. ROAD DESIGN STANDARDS CHANGED:
----- WIDTH, FROM 5.5 M TO 7.0 M.
----- DEPTH, FROM 30 CM TO 30 CM ABOVE FLOODING.
----- DRAINAGE, DESIGNED TO ACCOMMODATE LOW MAINTENANCE AND LOCAL FLASH FLOOD CONDITIONS.

----- FYI. ALIGNMENT, HORIZONTAL AND VERTICAL CURVES MAINTAINED AT ORIGINAL SPECIFICATIONS FOR DESIGN SPEED OF 82 KPH.

EE R ----D. MINIMUM MAINTENANCE CARRIED OUT ON KAEDI TO M'ECOUT TO K 72 PORTION OF ROAD (198 KM) TO PROVIDE NECESSARY ACCESS TO CONSTRUCTION SITE.

----E. CONSTRUCTION OF ROAD BEGUN AND MOVING AT THE RATE OF 10 KM PER MONTH; 20 KM OF ROAD BUILT.

----F. HYDROLOGY STUDY AND DRAINAGE WORKS DESIGNED FOR K 72 TO SELIBARY SEGMENT.

----G. ALIGNMENT CLEARED FROM K 72 TO GOURAYE.

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-----E. OFF-SHORE AND LOCAL SUPPORT AND PROCUREMENT SYSTEMS ESTABLISHED AND WORKING.

UP [3. THERE ARE A NUMBER OF OPTIONS FROM WHICH AID CAN CHOOSE WITH RESPECT TO THE FUTURE IMPLEMENTATION OF THIS PROJECT.

A. TERMINATE PROJECT WITH PRESENT FUNDS. AT THAT TIME THE PROJECT WILL HAVE COMPLETED CONSTRUCTION OF THE ROAD FROM M'ECUT TO SELIBABY, OR ABOUT 22% OF THE ORIGINALLY PLANNED CONSTRUCTION. IN ADDITION TO THE CONSTRUCTION THERE WILL BE AN EQUIPMENT PARK OF WELL MAINTAINED HEAVY EQUIPMENT, VEHICLES, MACHINERY, CULVERTS AND THE INFRASTRUCTURE NEEDED (CAMPS, MAINTENANCE EQUIPMENT, ETC.) TO CONTINUE ROAD CONSTRUCTION.

B. CONSTRUCTING VARIOUS SEGMENTS OF THE ROAD WITHOUT COMPLETING THE WHOLE ROAD FROM KAEDI TO GOURAYE. EACH OF THESE OPTIONS HAS AN ASSOCIATED COST AS PRESENTED BELOW. SEGMENTS AND COSTS OF OTHER COMPONENTS:

-----M'ECUT TO SELIBABY. ADDITIONAL COST DOLS .8 MILLION.

-----M'ECUT, SELIBABY, GOURAYE. ADDITIONAL COST DOLS 2.8 MILLION.

UP [4. -----M'ECUT TO KAEDI; M'ECUT TO SELIBABY. ADDITIONAL COST DOLS 4.5 MILLION.

COMPLETING THE ROAD AS ORIGINALLY SPECIFIED IN THE PROJECT PAPER WITH THE IMPROVED ENGINEERING - DOLS 5.9 MILLION. USAID'S COST ANALYSIS IS BASED ON A SPECIFIC DESIGN STANDARD FOR THE ROAD AND DRAINAGE STRUCTURES. IT FOLLOWS THE RECOMMENDATIONS OF THE CONTRACTOR AND OF THE AID/W ENGINEER WHO HAS BEEN ON TDY IN MAURITANIA FOR THE PAST FIVE MONTHS. IT IS CONSIDERED THE MINIMUM ACCEPTABLE FOR THE PREVAILING CONDITIONS.

UP [5. USAID STRONGLY FAVORS COMPLETING THE PROJECT AS ORIGINALLY PROPOSED FROM KAEDI TO GOURAYE. THIS IS CONSISTENT WITH THE ORIGINAL PLAN AND WITH OUR EXISTING AGREEMENT WITH THE GIRM. THE OBJECTIVES ARE COMPLETION OF 279 KM OF ROAD AND THE PROVISION OF INFRASTRUCTURE NEEDED FOR AGRICULTURAL DEVELOPMENT. COMPLETION OF THIS PROJECT CONFORMS TO THE USAID DEVELOPMENT STRATEGY AND GEOGRAPHICAL FOCUS. FUTURE PROJECT DEVELOPMENT ACTIVITIES WILL BE IN THE BASIN AND THE PROJECT ROAD IS ESSENTIAL FOR GOOD COMMUNICATIONS.

ACCORDINGLY WE RECOMMEND THAT THE PROJECT SHOULD BE AMENDED AS NECESSARY TO PERMIT COMPLETION OF CONSTRUCTION ON THE ROAD SEGMENTS AS SET FORTH IN THE PROJECT PAPER AND THE PROJECT GRANT AGREEMENT, AS MODIFIED, TO INCLUDE REMEDIAL WORKS ON THE M'ECUT TO KAEDI SEGMENT.

UP [6. USAID RECOMMENDS REJECTION OF OPTIONS OTHER THAN COMPLETION OF THE ROAD FOR BOTH DEVELOPMENTAL AND POLITICAL REASONS WHILE RECOGNIZING THAT AID DOES NOT HAVE A LEGAL OBLIGATION TO CONTINUE ONCE FUNDS OBLIGATED ARE EXHAUSTED. A PREREQUISITE TO DEVELOPMENT OF THE REGION IS GOOD COMMUNICATIONS. COMPLETION OF THE ROAD FROM M'ECUT TO SELIBABY LEAVES GOURAYE ISOLATED AND LEAVES THE KAEDI-M'ECUT SECTION IN POOR SHAPE. COMPLETING ONLY THE KAEDI TO

UNCLAS SECTION 23 OF * NOVA SCOTIA 21718

LIBRARY PORTION STILL LEAVES GOURAYE ISOLATED. PROVIDING ACCESS TO GOURAYE HAS BEEN AN OBJECTIVE OF THE PROJECT AS GOURAYE IS ON THE RIVER AND THE GOVERNMENT AND OTHER CONCERNS (IFAD, IERE) ARE PLANNING IRRIGATED AGRICULTURAL PROJECTS IN THAT SECTOR. POLITICALLY, IT WOULD BE QUITE UNSATISFACTORY TO HAVE MADE A "COMMITMENT" TO BUILD AN IMPORTANT ROAD IN THE RIVER BASIN AND THEN NOT TO COMPLETE IT.

UH #7. USAID IS PREPARED TO REEVALUATE PLANNED DEOBLIGATIONS OF UP TO DOLS 5.2 MILLION FOR THIS PROJECT UNDER DECE-REOB AUTHORITY. (THESE DEOBLIGATIONS WILL COME FROM PROJECTS THAT WERE TERMINATED LAST YEAR WHEN USAID FINANCED ACTIVITIES IN RURAL DEVELOPMENT STOPPED.) BASED UPON THE REVISED FINANCIAL IMPLEMENTATION PLAN AND CASH FLOW ANALYSIS FOR PL 482 SECTION 226 GENERATED LOCAL CURRENCY, WE ALSO RECOMMEND THE USE OF THE AVAILABLE GENERATIONS OF DOLS 722,224 FROM PL 483 SECTION 226 IN-COUNTRY FOOD SALES PROCEEDS FOR LOCAL COST REQUIREMENTS. AVAILABILITY OF THESE ADDITIONAL FOOD SALES PROCEEDS REQUIRES APPROVAL FROM THOSE RESPONSIBLE FOR THE SECTION 226 PROGRAM (GIRM AND AID/W). WE ARE PREPARED TO SEEK THEIR CONCURRENCE IN OUR PROPOSED PROGRAM. THUS, NO NEW FY1984 DA FUNDS AUTHORIZATION WOULD BE NEEDED TO COMPLETE THE PROJECT AS PROPOSED.

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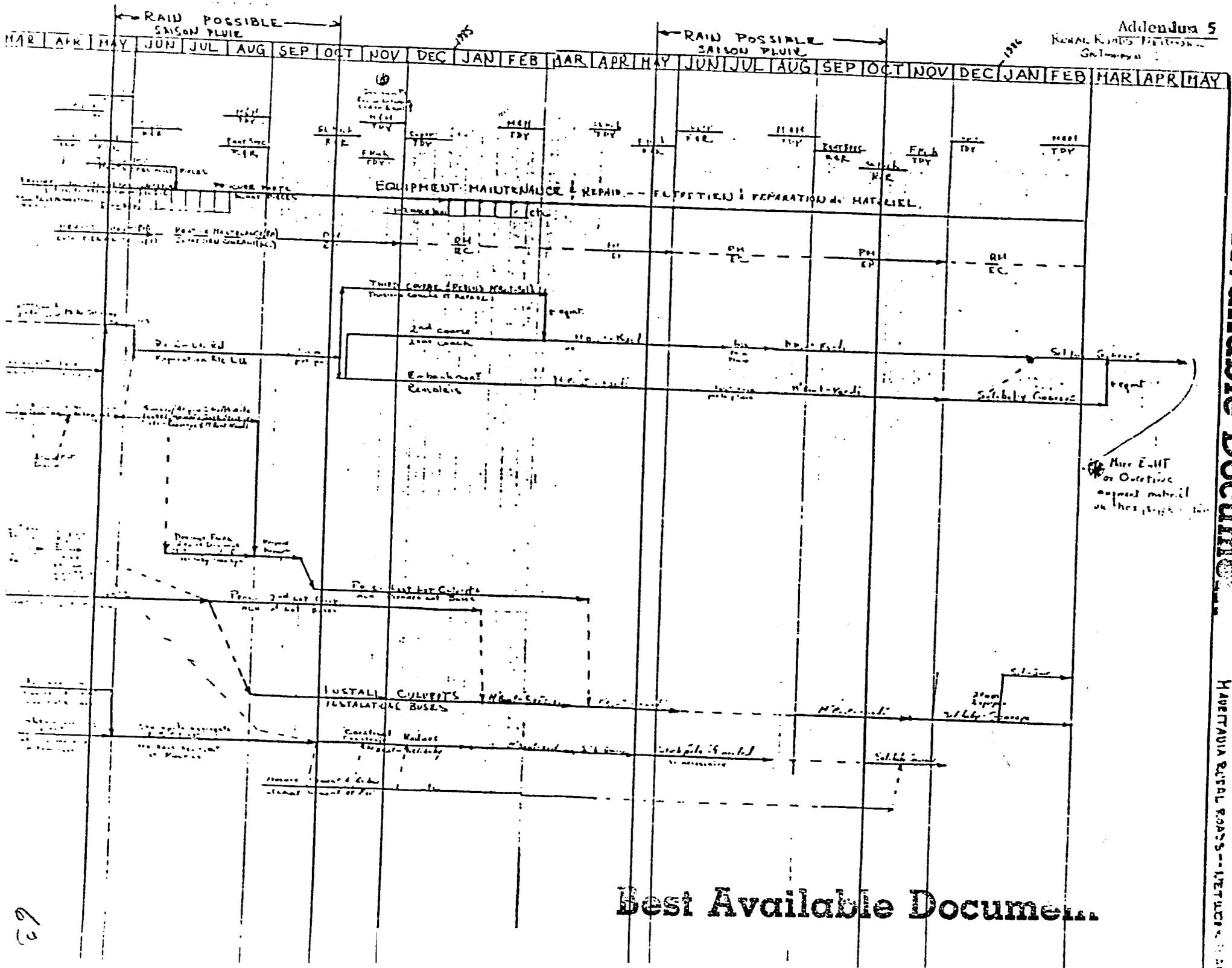
8. DISCUSSIONS HAVE BEEN HELD WITH REPRESENTATIVES OF THE UNIP, UNSC AND OPE CONCERNING THE C-170 PORTION OF THE ROAD AND THE REHABILITATION NEEDED. DURING THE WEEK OF 9 APRIL AN UNSC/OPE TEAM VISITED USAID AND THE PROJECT SITE. UNSC AGREES THAT REMEDIAL WORK IS REQUIRED BUT STATES THAT FUNDS ARE NOT AVAILABLE. WHILE USAID RECOGNIZES THAT WE ARE NOT RESPONSIBLE FOR THE C-170 PORTION OF THE ROAD, IT IS UNFORTUNATELY LOCATED IN THE MIDDLE OF THE ROAD WE ARE FINANCING AND NEEDS TO BE REHABILITATED. UNSC HAS BEEN REQUESTING DCNCR FINANCING FOR A SECOND PHASE OF ITS RURAL ROADS ACTIVITIES IN MAURITANIA FOR MORE THAN ONE YEAR. WERE THEY TO GET FUNDS THE C-170 ROAD WOULD BE A HIGH PRIORITY USE OF THESE FUNDS. UNSC HAS NOT BEEN SUCCESSFUL IN FINDING DCNCRS FOR THE MAURITANIAN PROGRAM AND WE DOUBT THEY WILL COME UP WITH THE FUNDS REQUIRED IN A TIMELY MANNER.

9. FYI UNSC IS BEGINNING ROAD MAINTENANCE ACTIVITIES IN THE SAHEL. FUNDS COULD CONCEIVABLY BE MADE AVAILABLE FOR MAINTENANCE ACTIVITIES ON THE KAEDI-GOURAYE ROAD WHEN CONSTRUCTION IS COMPLETED. A DAFAR BASED, UNSC FINANCED, ENGINEER WILL BE POSTED SHORTLY. THIS ENGINEER'S WORK WILL INCLUDE DEVELOPMENT OF A MAINTENANCE PROGRAM FOR THE KAEDI TO GOURAYE ROAD. END FYI.

10. ENGINEER THOMPSON AND THE USAID EVALUATION WILL ARRIVE IN AID/W DURING THE FOURTH WEEK OF APRIL. REQUEST PROJECT COMMITTEE BE CONVENED UPON THOMPSON'S ARRIVAL TO CONSIDER PROPOSED CHANGES IN TECHNICAL PLAN AND FINANCING PROPOSAL. USAID RECOMMENDS THAT PP SUPPLEMENT AND AUTHORIZATION BE COMPLETED IN AID/W WITH THOMPSON'S PARTICIPATION. ALTERNATIVELY, WITH AD HOC DELEGATION FROM THE AA/AFR AND CITY ASSISTANCE FROM AFR/PO/SWAP (SIMMONS) THE MISSION COULD PREPARE PP SUPPLEMENT AND AMEND AUTHORIZATION IN THE FIELD. PLEASE ADVISE.

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HAUTENAIA RURAL ROADS - DISTRICT

COST ANALYSIS

ADENDUM 2

I Technical Assistance:

A. M & M Contract Assume \$60,000/month
Accrual

Lump sum \$30,000 added for
additional TDY &

until

Mar 1 1986

basically cause it's there.

± 15% imprecision gives up to 3.6 months more

Note: Independent of but similar to Parsons ± 4 months

B. Geo Poulin Amend for 1 yr of
Project \$8,000/month accrual
will cover everything

Assume no raise, but should
cover small one.

II COMMODITIES:

Off shore

A. Drainage requirements (culvert & Gabions) were

based upon Drainage Study assume

PK 70 - Sébiba requirements = ~~Geo~~ Séliba

- Gouraye = M Bout-Kaedi

For Culverts: $463,000 \times 3 = \$1,389,000$

For Gabion amount was $3 \times 95,000 = 64$
 $= \$285,000$ reduced to half bet...

Gabion use not anticipated as yet. RIP RAP and/or mortared RIP RAP to substitute.

\$ 142000 budgeted for Gabions could be used for ^{addit} culverts if required. ~~the~~ Note: Kauli requirements estimated very low maybe too low. But many structures in place are useable w/ modifications. Time will tell.

B. Spare Parts: Total Parts estimated at ~~3000~~ Value of fleet x 20%/yr ÷ 12 m/yr = ^{Value} Parts/month = 3000000 x .2 x 1/12 = 50,000 of this 15,000 was programmed

for local costs procurement.

∴ \$35,000 per month was programmed for off-shore parts procurement.

Note: Though it could be assumed that parts need not be procured the last several months... The maintenance objective of this project and the possibility of future road building with this equipment require that spares be in stock at the E.O.P. ~~Amount~~

For misc. small tools
& supplies & equipment

\$1000/month each was allowed.

Lump sum requirement of \$19,000 was estimated for additional refurbishing during this time.

4/7

season. Already ~~approx~~ approx \$500 000
has been spent of spare off shore

III For P.O.L. offshore. This line
item will be melted into
the commodity line item
after remaining funds are used.
Almost all P.O.L. products are
now purchased locally ~~and~~
under the next line item.

IV Local Costs

A Personnel: \$43,000 per month
used which is about 20% higher
than existing payroll to allow
for additional operators and
concrete and culvert workers
plus short-term personnel
required from time to time.

- B. Local Travel: \$1,000 per month used
- C. Vehicle Maintenance & Repair: \$4,000 per month used
part of \$15,000 local
spare budget

D. POI's - Computed from past
experience based upon
estimated fuel consumption
of 70-80,000 l/month
+ factors for oils, lubricants
etc

+ transport included here
as transporters sometimes
can get fuel when no one
else can = \$45,000/month

$$75,000 \times \frac{22 \text{ UN/l}}{50} + \frac{4 \text{ UN/l}}{50} \text{ trans} = \$39,000$$

$$\text{Oil \& lubs } 15\% = \$5,850$$

Use \$45,000

E. Machine & Equip: Includes Repair
of CAT Equipment, CAT spare

other spares & other equip
(6000/month) 0/month

Total monthly cost: \$8000/mo

= another part of \$15000/mo

Lump Sum Amounts Total Spares
of Other Items: \$411,000

Plus 163,000 already spent.

F. Bldg & Structure: \$1000/mo used
based on past exp

G. Mat'l & Supply Off/Admin \$1000 used
DITTO

4. Mat'l & Supply ^(Tech): Generally 1000/mo
DITTO

Plus Cement & Rebar computed
based on Radier Design by
Thompson and extrapolation
as w/ culverts L.S.: \$529,000

I. Freight \$300/month based on experience

J. Construction - 25 contract \$147000

K. Well Construction: Bid for a given ^{dup} well w/ pump etc. \$80,000

L. Contingencies 5% of new costs

M. DAKAR based on exper \$400/month

V. Socio Econ Old est accepted

VI Contingencies other than local 5% ~~of~~ of new costs

VII Imprecision +/- 5% as estimated based upon limited data.

NETWORK PLANNING COMPUTATIONS

1. EMBANKMENT CONSTRUCTION

Average 5 km/month/scrapper/1/2 dozer

Begin Km 20 w/ 2 scrapers & one dozer
Feb 25

$$\frac{26 \text{ km}}{2 \times 5 \text{ km/month}} = 2.6 \text{ months}$$

~~May 15~~ May 15 arrive Selibaby

2. Second Course -> Selibaby -

Begin km 12 April 5 w 1 Dozer

Assume 3 Dumps average 3 Dumps
10 km/month w 1 Dozer OT + between piles
1 scraper

still 5 km/month construction

→ 15 km/month

by 15 May = 1.3 months

$$15 \times 1.3 = \underline{19.5 \text{ km}}$$

Remaining $46 - 12 - 19.5 = 14.5 \text{ km}$

Adding 2 more scrapers & Doyer
 $10 \text{ km/mon} + 15 \text{ km/mon} = 25 \text{ km/mon}$

$$= \frac{14.5 \text{ km}}{25 \text{ km/mon}} = \underline{.58 \text{ mon}}$$

3. Anticipated for Courage Embank

longer haul 15% less production

$$.5 \text{ km/scrap} \times .85 = 4.25 \text{ km/scrap}$$

$$\times 3 \text{ scrap} = 12.75 \text{ km/mon}$$

$$\frac{45 \text{ km}}{12.75} = 3.53 \text{ mon}$$

Assum. 20 rainy days 3 day lost
 per rain day = 60 lost days

$$\text{Go to } 5.5 \text{ months} = \frac{17}{1}$$

4. Option (*) VN upgrade
 from 70 → Garfa
 then M'Bout to Garfa

70 km small x section
 3 Dozers 2 D7 + D6
 3 scrapers 5 km/month/scrap = 15 km/month
 2 Dumps 5 km/month ave

2 for stockpiling Aggregate

2 being revised

= 20 km per month (also some
 km no work
 needed
 but longer haul
 an area to work)

Assume 15 Rain days (farther north)
 only
 1.2 days lost per rain day
 (less time due to more granular
 quality of mat)

$$\frac{0 \text{ km}}{0 \text{ km/month}} = 3.5 \text{ month} + 1. \text{ month}$$

$$= 4.5 \text{ months} \quad \text{Oct 15 20}\pm$$

5. M-Bout - Kaedi
EMBANKMENT

Given short hauls anticipated
even with deep fills assume
15 km/month w 3 scrapers

$$\frac{118 \text{ km}}{15 \text{ km/month}} = 7.9 \text{ months}$$

Say 2 scrape = $7.5 \times 1.5 = 11.25$

6. → Gouraye Embankment
w/ 2 scrapers

lost to rain 45 days

$$3.5 \times 1.5 = 5.25 + (2 \text{ rain}) = 7.25$$

w 3 scrap after rain 3.5 month

Km 70 → ~~Belibaby~~ ^{repair}

7. ~~Third~~ Course 3 dumps 1 scraper
2 dozer

say 20 km per month

Check w/ Jerry

$$\frac{46 \text{ km}}{20} = 2.3 \text{ months}$$

longest haul ?
thinnest course ?
no experience.

+ 2 months reconstruct
= 4.5 months

8. - M. Bout: Kadii Second Course

$$\text{say } 7 \text{ km/month} \times 4.5 \text{ months} = 31.5 \text{ km}$$

$$118 - 31.5 = 86.5$$

w/ 5 Dumps & scraper on 3 dozers

$$\text{say } 27 \text{ km/month} = \text{for } 86.5 \text{ km}$$

$$= 3.93 \text{ mon } \quad 1 \text{ month lost to rain}$$

9. M Bout Kadii Third Course lose scrap after 3.5 mon

$$\text{say } 27 \text{ km/month} \times 3.5 \text{ mon} = 94.5 \text{ km}$$

1 month / 7 km more then add during $\frac{118 - 97 - 17}{20} = 1.2 \text{ mo}$ Total 5.7 mo - 75

10 Ali-Houaye 2nd Course & 3rd
6 Dumps

20km/mon for 1.6 mon = 32km

$45.2 - 32$
= 35 km/mon for ~~79~~ ^{58 km} ~~45 km~~

1.7 month
= ~~1.8 months~~

total 3.1 too long need dumps

11 Radiers used approx 4.4 m³/hr
need skip loader
Dump X 8hr/day

X 2.6 day/mon = 915 m³/mon

M'Bout Aclibaby = $\frac{3000 m^3}{915} = 3.27$ mon

Kaedi M'Bout = $\frac{2000 m^3}{915} = 2.19$ mon
= M'Bout-Gouraye +

Add one month at c/c. 76

12 For Culverts assume 1 ^(single or multi) per day per team 7/7

17: Bout to Kelibaby 135 days ÷ 5.2 mon
+ 1.5 mon for VN

assume 5 mon ex. Kelibaby - Hou
11 Bolt - Hand

Probably the 3 scraper option on Embankment would be preferable to complete embankment before structures but in any case more detailed analysis and better production figures are required to determine if additional equipment is required or if overtime or rentals might be the answer.

84

RAIN POSSIBLE SAISON PLUIE

1983

MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR AP

ETA USAIN
RIGR

COP ETA
orientation

SMACH
TDY

F Mech
R&R

Super
R&R

M&H
TDY

EQUIP SPEC
R&R

SL Mech
R&R

Decision Pt
Revise Network
Order EQMT?

M&H I
TDY

F Mech
TDY

Super
TDY

M&H
TDY

SL Mech
TDY

TD for PSC
PARTS SPECIALIST PIECES

PREPARE COMPREHENSIVE MAINTENANCE PLAN
PLAN ENTRETIEN COMPREHENSIF
MACH ENG & BUSES & TRAU
→ NAC

PROCURE PARTS
ACHAT PIECES

EQUIPMENT MAINTENANCE & REPAIR

1-2 MACH NUM etc

PERIODIC MAINT (PM)
ENTRETIEN PERIODIQUE (EP)

ROUTINE MAINTENANCE (RM)
ENTRETIEN COURANT (EC)

P
E

RM
EC

2eme couche
2nd course PK 70 - Selibaby
+ 2 scrapers

Embankment PK 70
Remblais selibaby

Repair UN Rd
Reparation Rte UN

loss rain
perte pluie

THIRD COURSE & REBUILD M'Boit - Selibaby
Troisième couche et REFAIRE

2nd course
2eme couche

Embankment
Remblais

egmt.

M Boit

M Boit - K

Asphalt/CGG As built UN RATION/CGG
implant/scrub. level UN & impl. T
UN

Survey/Align/CHG/Profile
level/implant/scrub/Profile
Seli - Gouraye & M'Boit Kaeili

ReAlign Plot
Designe

1986

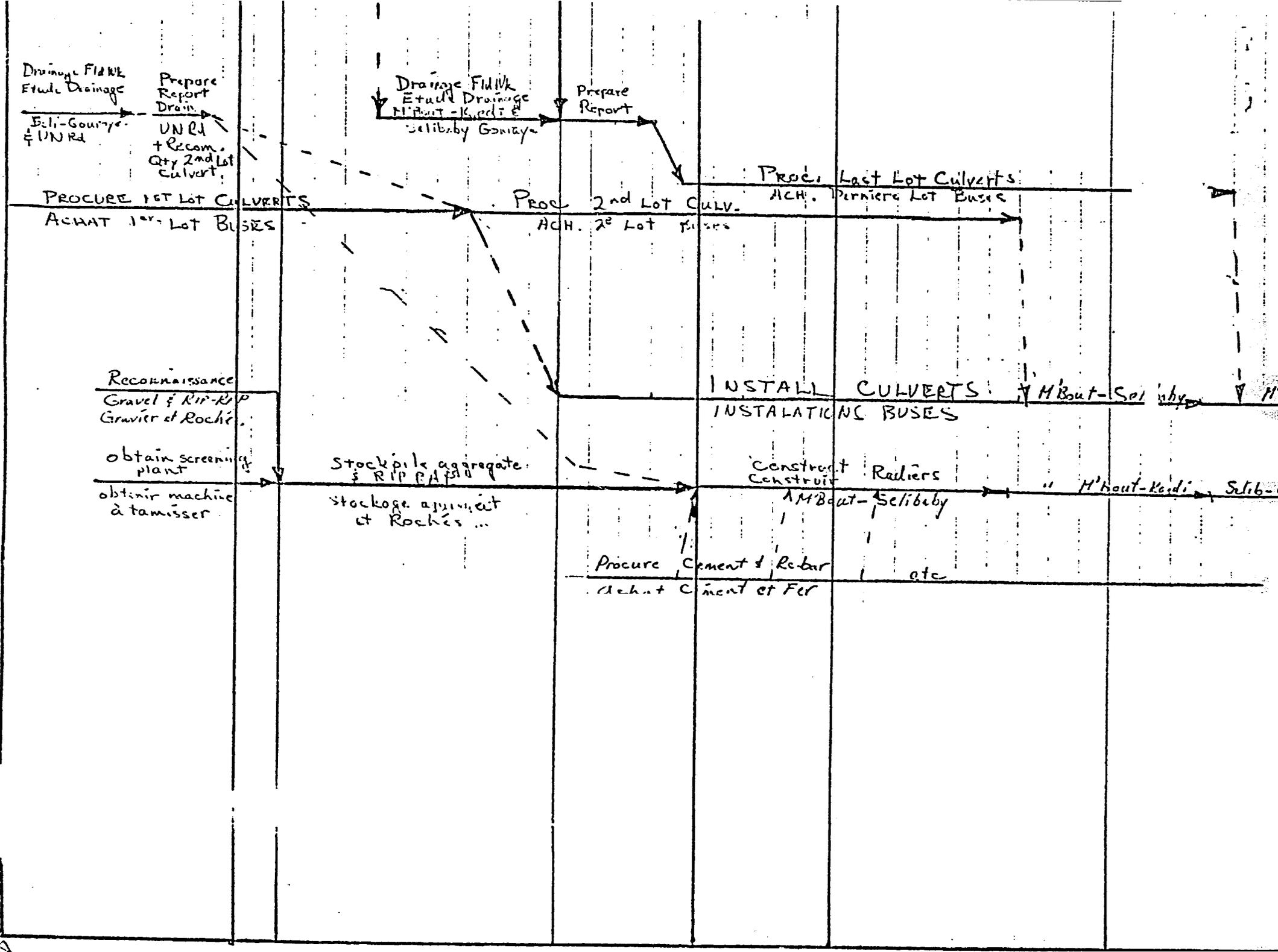
← RAIN POSSIBLE
 SAISON PLUIE →

MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY

	Super R&R		M&M TDY	EMTSPEC R&R	sh. Pch R&R	Flash TDY	Super TDY		M&M TDY					
sh. Pch R&R														
ENTRETIEN & REPARATION de MATERIEL														

More EQHT
 or Overtime
 augment materiel
 ou hrs' issons militaires

bb



MAURITANIA RURAL ROADS NETWORK PLAN

