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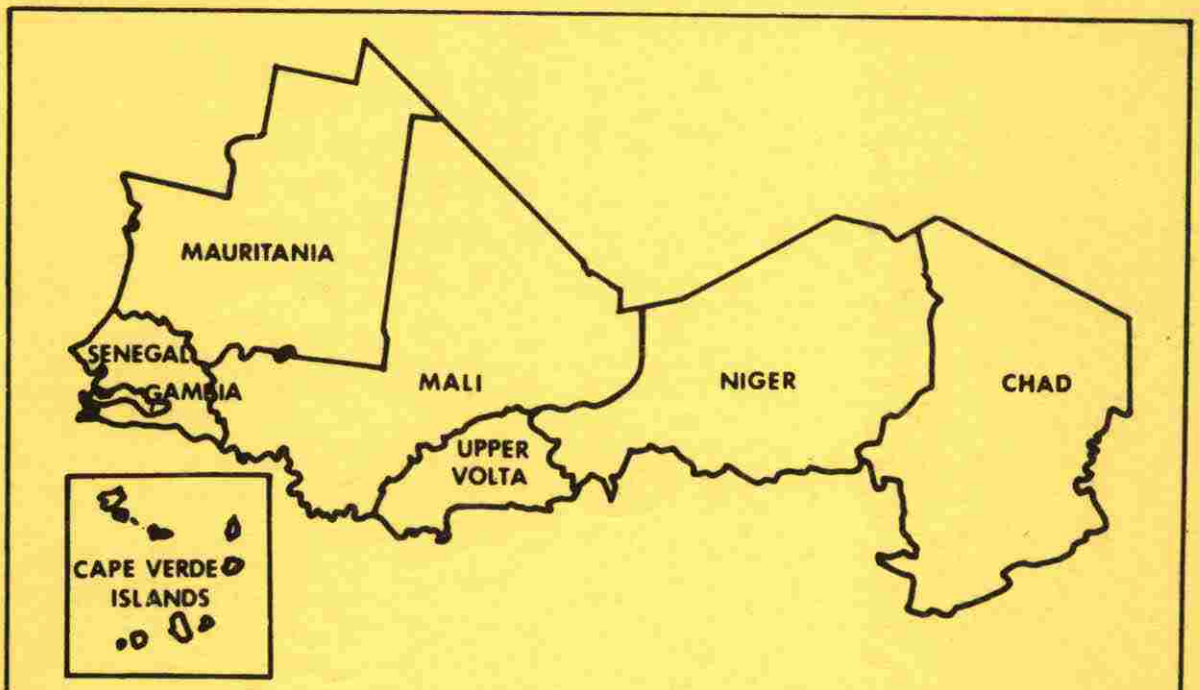

ROAD MAINTENANCE DIAGNOSTIC STUDY FOR THE SAHEL

COMPLEMENTARY NOTE

VOLUME 3

THE GAMBIA

LOUIS BERGER
INTERNATIONAL, INC.
U.S.A.

Financed by U.S.A.I.D.

September 1978

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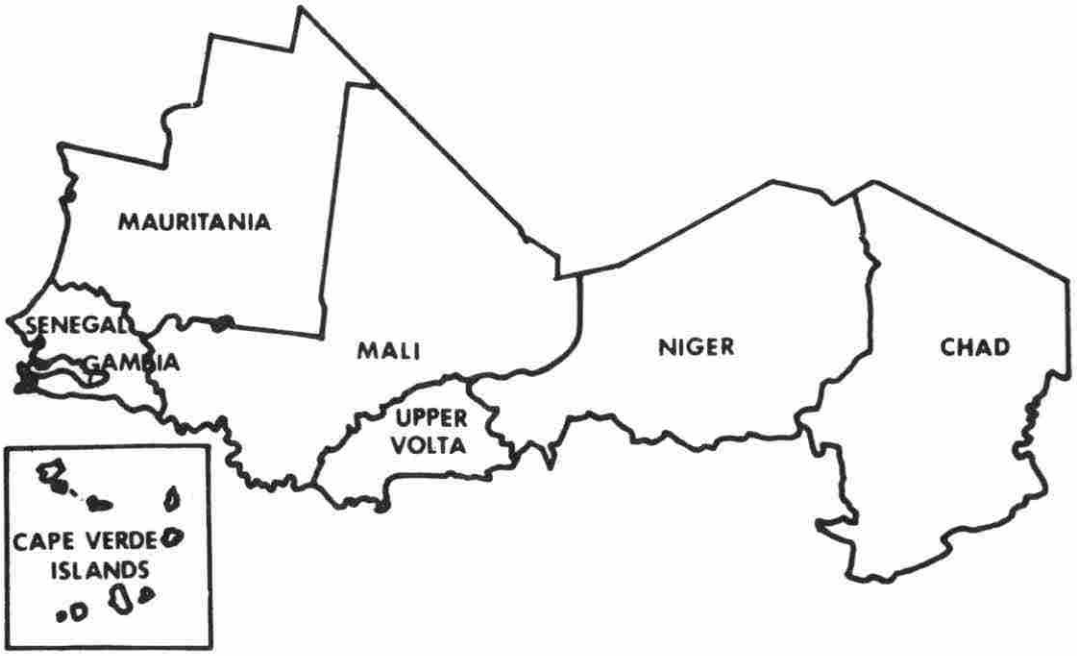

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INTRODUCTION

It was decided at the February 1978 meeting of the Transport and Infrastructure Team of the Club des Amis du Sahel of the Permanent Committee of States to Combat the Drought in the Sahel (CILSS), in the Cape Verde Islands, to establish a complementary note which would take into account any modifications to the maintenance and rehabilitation programs proposed in the Diagnostic Study expressed by the Governments concerned. This note follows the following outline, in addition to the introduction:

1. Synthesis

Chapter 3.1 of the Draft Final Report has been rewritten to take into consideration the main comments of the Government.

2. Miscellaneous

This chapter deals with some of the comments not included in the Synthesis and includes corrected tables.

The status of the UNSO study roads and considerations about the national training program are also included.

3. Government's comments

It must be noted that two detailed studies, "Highway Maintenance Study" and "Integrated Transport Study," are presently being conducted in the Gambia. Consequently, many of the points raised in the present report will be more fully analyzed during the study of final road maintenance programs for the Gambia.

1. SYNTHESIS

1.1. Current situation

a) Introduction

The Gambia has an approximate total area of 11,000 square kilometers. Completely surrounded by the territory of Senegal, the Gambia is crossed by the Gambia River, which is navigable by ocean-going vessels.

The climate is characterized by alternating seasons : a tropical rainy season (from June to October) and a dry season (from November to May).

The Gambia has a population of 535,000 inhabitants. With a land area of 10,400 square kilometers, Gambia's density per square kilometer makes it one of the most populated countries in Africa.

Banjul, the capital, has a deep water harbor. Other principal cities are Sukuta, Bwian, Mansa-Konko; Georgetown, Basse, Kuntaur, Farafenni, and Kerewan-Kauntour.

Subsistance agriculture and groundnuts constitute the backbone of the Gambian economy. The principal food crop and the staple food is millet, the cultivation of which alternates with that of groundnuts, maize, cassava, and rice.

The industrial sector is still quite limited and consists essentially of factories for processing groundnuts.

It is hoped that tourism will continue to develop rapidly.

b) Road Network and Traffic 1977

Many of the roads have been officially classified under the "Sixth Schedule of the Motor Traffic Regulations" in the laws of the Gambia and the Schedule's later ammendments. This is a legal and administrative classification, Class I, II and III as shown on the official Gambia Road Map. However it is accepted that classification should be revised and the two form, three tier classification proposed hereafter is more descriptive.

Administrative classification

- Primary roads
- Secondary roads
- Feeder roads

G A M B I A

TABLE 1.1

ROAD NETWORK 1977

Class	Paved Road	Gravel Road	Earth Road All Weather	Earth Road Dry Weather	TOTAL by class
Primary Roads	277	425	-	174	876
Secondary Roads	27	103	-	-	130
Feeder Roads	-	-	1,696	258	1,954
Total by type	304	528	1,696	432	2,960
P.W.D. responsibility	304	528	-	-	832
Maintained by P.W.D.	304	528	-	-	832
% of total network	10%	18%	57%	15%	100%

Source : Interviews with P.W.D. officials.

Primary roads run parallel to the North and South banks of Gambia River. Secondary roads serve the areas surrounding the capital, while feeder roads bring traffic to the main roads.

Technical classification

. Paved roads (304 km)
. Gravel roads (528 km)
. Earth roads (2128 km)

Table 1.1 summarizes the road network in 1977.

The Public Works Department (P.W.D.) has undertaken bi-annual traffic counts. Due to staff limitations, the results have not yet been fully analyzed and further work will be needed to correct some unrealistic results. The bi-annual P.W.D. traffic counts are now complemented by more detailed traffic surveys realized for specific studies.

The P.W.D. has a road register listing the roads it maintains, giving length and types of surface and qualifying surface condition of each section as : good, fair, poor or bad. With minor improvement, this register could probably be used to gather detailed data for analysis of adequate maintenance levels and the elaboration of resulting maintenance programs.

c) Organization, Means, and Methods

Road maintenance is the responsibility of two organizations : the Ministry of Works and Communications and the Ministry of Local Administration. The Public Works Department of the Ministry of Works and Communications is responsible for paved and gravel roads, while the Ministry of Local Administration, through the regional commissioners, takes charge of the remainder of the network, including almost all of the earth roads.

The Public Works Department is made up of three branches : Building Branch, Civil Engineering Branch, and Transport Branch.

The Civil Engineering Branch of the headquarters organization does very little direct road maintenance. The department divisions are responsible for building construction by force account and contractor, all building maintenance, supply and maintenance of furniture and equipment to Government installations, river wharves ferry ramps, airfield maintenance, all road construction including "private" roads (P.W.D. is the only organization with bitumen capability), celebration arrangements, quarries, shell deposits, crushing and screening. They also do about 99% of all the road

maintenance carried out in the Gambia. Of the total time of the Civil Engineering Branch (Headquarters and Divisions) not more than 30% could be devoted to road maintenance, probably nearer 20% until each division has a highway engineer. The mechanical branch devotes about 20% of its efforts to road maintenance (maximum), probably 15% until the senior mechanical engineer posts are all filled.

Two organization charts in the following pages show the structure of the Public Works Department before and after the March 1977 reorganization.

Financial resources

The only budgetary source is the national budget ; road fund does not exist in the Gambia.

Direct expenditures (budgeted and actual) for highway maintenance in Gambia are presented in Table 1.2.

This table shows a considerable financial increase for highway maintenance during recent years. Nevertheless, the funds allocated are still insufficient to meet all maintenance needs.

Equipment

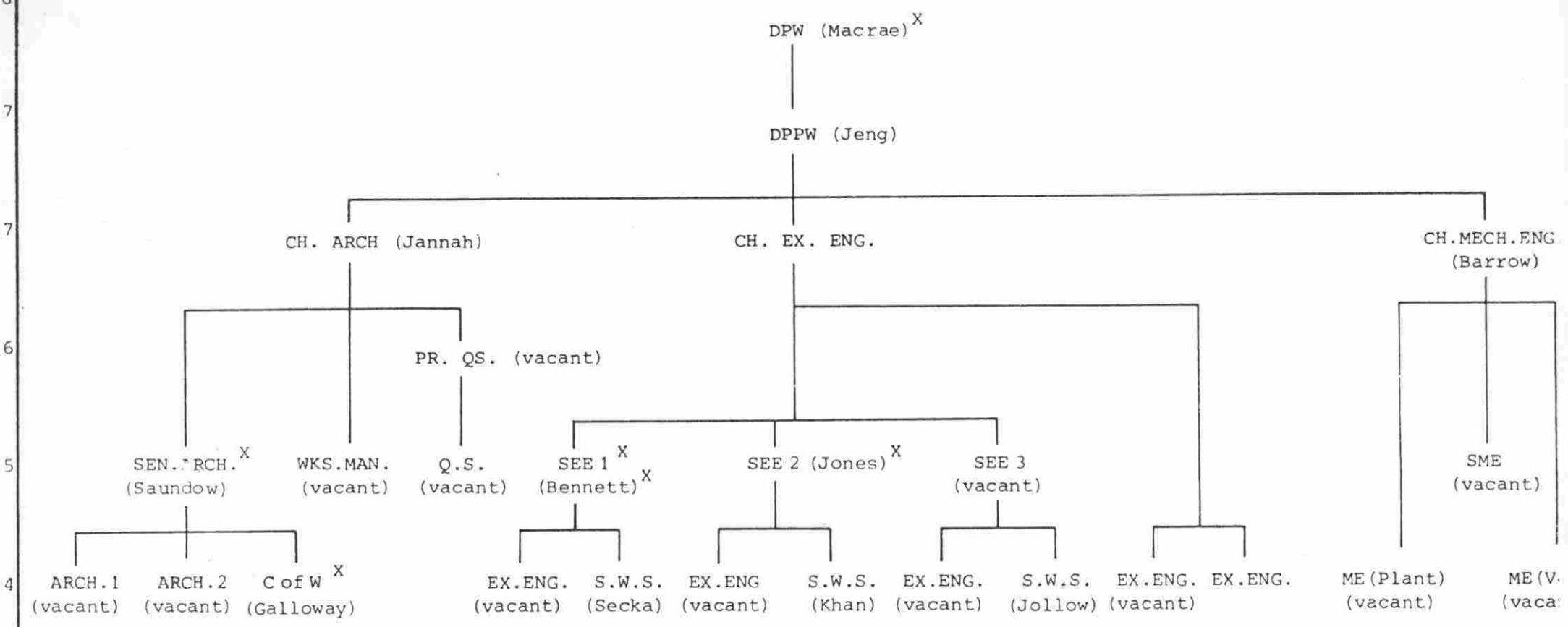
The equipment fleet has been inadequate in number for a number of years in order to efficiently carry out maintenance works, along with other work it is called upon to perform. This had led to its being over used, leaving little time for proper maintenance. 65% of the equipment is over 10 years old, having performed considerably more working hours than this period indicates, which has thrown an impossible burden on the few competent mechanics available and made spare parts procurement more difficult.

The Transport Branch is responsible for the operation of the workshops. In addition to the central workshop in Banjul, there is a small temporary field site in Bakko near the airport ; a moderate-sized regional shop in Mansa-Kondo ; and two small shops in Georgetown and Basse.

All machine tools are registered and numbered with indication of their quality, location and age. Existing accounting procedures should be reserved to produce results sufficiently detailed to allow rational planning of equipment maintenance.

PUBLIC WORKS DEPARTMENT - PROPOSED MANAGEMENT ORGANISATION

PRIOR TO MARCH, 1977



POSTS FILLED BY NATIONAL STAFF ——— 7

POSTS FILLED BY EXPATRIATES ——— 5

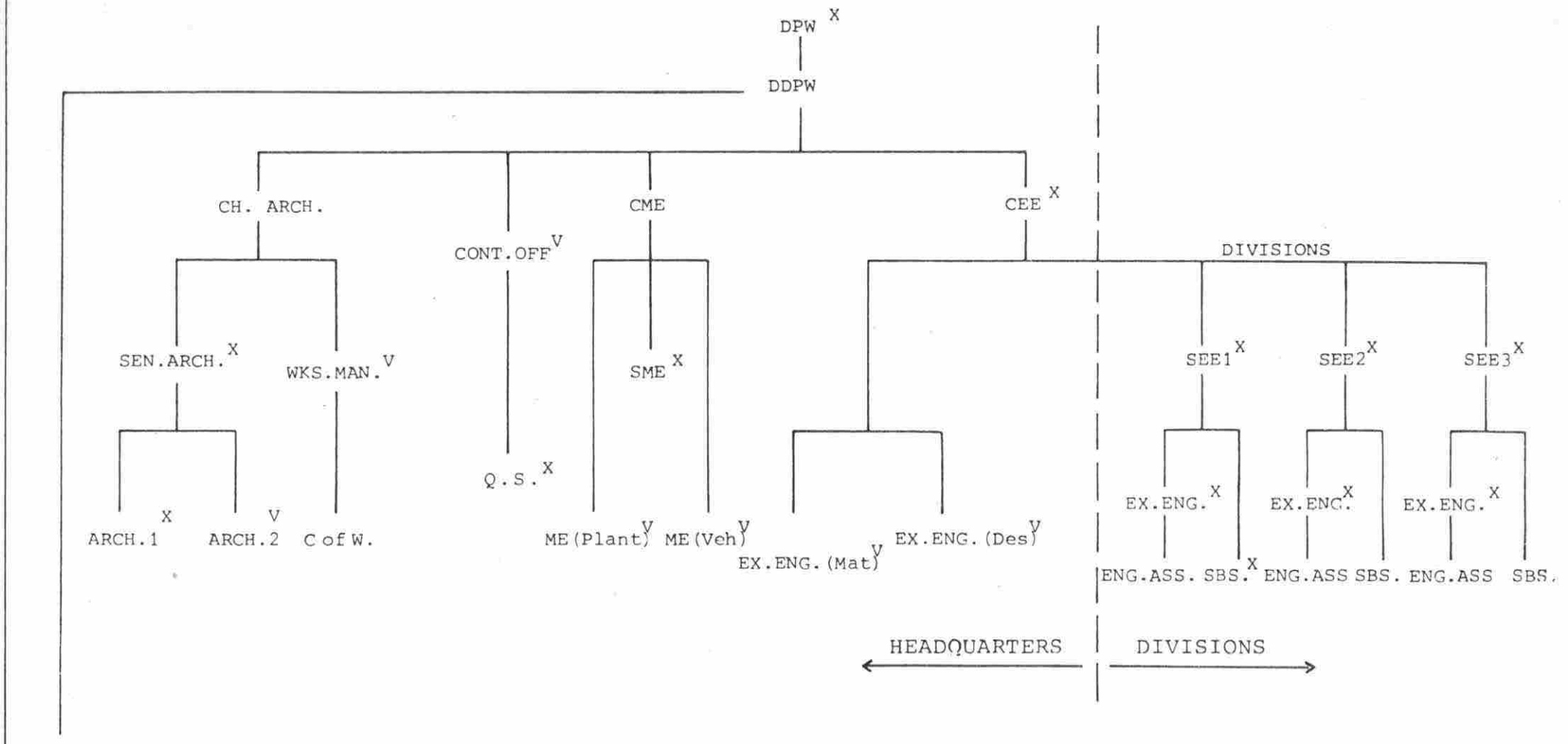
POSTS VACANT ——— 14

26

X POSTS FILLED BY EXPATRIATE STAFF

THE GAMBIA - PUBLIC WORKS DEPARTMENT

MANAGEMENT ORGANISATION - MARCH 1978



POSTS FILLED BY NATIONAL STAFF — 11

X POSTS FILLED BY EXPATRIATE STAFF — 11

V POSTS VACANT — 8

30

TABLE 1.2

THE GAMBIA

EXPENDITURE ON HIGHWAY MAINTENANCE
DIRECT EXPENDITURE
(Dalasis/Year)

(A) Roads and Bridges
(B) Trans Gambia Highway
(C) Banjul City Streets

Year		Approved Estimates		Actual Expenditure	
1977/78	(A)	1 200 000			
	(B)	150 000			
	(C)	81 000			
			143 000		
1976/77	(A)	600 000		1 343 630	
	(B)	17 500		14 087	
	(C)	81 000		228 576	
			698 500		1 586 293
1975/76	(A)	550 000		978 507	
	(B)	17 500		13 686	
	(C)	40 000		117 626	
			607 500		1 109 819
1974/75	(A)	550 000		733 721	
	(B)	17 500		20 019	
	(C)	40 000		51 709	
			607 500		805 449
1973/74	(A)	500 000		545 889	
	(B)	17 500		13 905	
	(C)	40 000		61 144	
			557 500		620 938
1972/73	(A)	500 000		487 766	
	(B)	17 500		14 602	
	(C)	40 000		31 296	
			557 500		533 664
1971/72	(A)	567 500		540 584	
	(B)	17 500		17 498	
	(C)	40 000		39 504	
			625 000		597 586
1970/71	(A)	575 000		532 475	
	(B)	17 500		17 885	
	(C)	40 000		38 130	
			632 500		588 490

The 1977 approved establishment of the two branches that are to take part in road maintenance are for the Civil Engineering Branch (95) and for the Transport Branch (464).

In March 1978 five of the Civil Engineering Branch's management are expatriate, as is one in the Transport Branch.

It is important to note that there are 14 vacancies out of a total of 26 senior management posts. This shortage of management staff makes it difficult for the PWD to carry out its normal work load.

All the established personnel are paid through the national budget. Gambian salaries are considered low compared to those of Senegal.

The present maintenance is mainly routine maintenance, although some periodic maintenance (re-sealing and re-gravelling) is carried out to the limit of the facilities available.

d) Principal Constraints

According to the Gambian Government, the main constraints to be overcome are, in order of significance :

- A desperate shortage of skilled and experienced management staff.
- Complete lack of hard rock or stone in the country.
- Shortage of accessible water (an important commodity in road construction and maintenance and a constraint common throughout the Sahel.
- Inadequate available equipment hours.
- Shortage (but not a complete lack of) skilled man power-training.
- Budget.

1.2 Maintenance Alternatives

a) Description

For the two types of roads maintained by the P.W.D., the Consultant has defined the theoretical annual frequencies per basic operation for both routine and periodic maintenance. These frequencies were drawn from the Consultant's experience in the area.

For each traffic level, three service levels were chosen : good, intermediate, and minimum. The minimum level would halt deterioration of the investment, while the good level would provide comfort to the users.

Three stategies are possible for carrying out the work : contractors, force account, or a combination of the two (régie à la tâche, or petty contractors). For the Gambia, with a limited road network, the use of contractors would require heavy mobilization and demobilization costs. The force account, with adequate means and appropriate planning, should provide acceptable results.

The combination of the two, called petty contractors in the Gambia, is economical for a country with such a high population density. To optimize results, countries should learn to combine these different strategies in appropriate proportions.

b) Unit Costs

Unit costs have been determined for the various maintenance operations and for each road type. These costs concern force account work and include costs for equipment, materials, and labor.

The following table summarizes the tax exempt per kilometer annual costs (1977 Dalasis without taxes) for various road types in relation to traffic volumes and service levels.

Table 1.3.1

PAVED ROADS - MAINTENANCE FREQUENCIES

Designation	Average Daily Traffic											
	60 - 100			100 - 200			200 - 400			400 +		
	G	I	M	G	I	M	G	I	M	G	I	M
Routine Maintenance - per year												
Clearing	1	1	1	1	1	1	1	1	1	1	1	1
Drainage	2	1	1	2	1	1	2	1	1	2	1	1
Culvert clearing	2	1	1	2	1	1	2	1	1	2	1	1
Small repairs	2	1	1	2	1	1	2	1	1	2	1	1
Traffic signals	2	1	1	3	2	2	3	2	2	6	5	4
Temporary patching	2	1	1.5	4	3	2	6	5	4	10	9	8
Permanent patching	0.3	0.2	0.1	0.4	0.3	0.2	0.5	0.4	0.3	1.0	0.7	0.5
Hand repair of shoulders	1	1	0.75	2	2	1.5	3	2.5	2	4	3.5	3
Shoulder and ditch reshaping	0.7	0.5	0.3	1	0.7	0.5	1	0.7	0.5	2	1.5	1.0
Periodic Maintenance - in year												
Wearing course	10	12	15	8	9	10	7	8	9	4	5	6

Notes : G = Good
I = Intermediate
M = Minimum

Table 1.3.2

EARTH ROADS - FREQUENCIES OF MAINTENANCE OPERATIONS

Designation	A D T											
	0 - 10			10 - 30			30 - 60			60 - 100		
	G	I	M	G	I	M	G	I	M	G	I	M
Routine Maintenance												
Clearing	1	1	1	1	1	1	1	1	1	1	1	1
Drainage clearing	1	1	1	1	1	1	1.5	1	1	1.5	1	1
Culvert clearing	1	1	1	1	1	1	1.5	1	1	1.5	1	1
Small repair of structures	1	1	1	1	1	1	1.5	1	1	1.5	1	1
Patching	2	1.5	1	3	2.5	2	4	3.5	3	5	4.5	4
Anti-corrugation	4	4	2	10	8	5	15	12	10	25	20	15
Reshaping	0.5	0.4	0.3	1.0	0.7	0.5	1.5	1.3	1.0	2	1.5	1.3

Notes : G = Good
I = Intermediate
M = Minimum

Table 1.3.3

MAINTENANCE COSTS WITHOUT TAXES
(In Dalasis)

Road Type - Traffic	Service Level		
	Good	Interm.	Minimum
Paved Roads			
60 - 100 VPD	2 978	2 167	1 795
100 - 200 VPD	3 687	2 916	2 551
200 - 400 VPD	4 231	3 372	2 966
400 - VPD	6 814	5 505	4 647
Gravel Roads			
20 - 30 VPD	2 409	1 858	1 626
30 - 60 VPD	3 028	2 452	2 146
60 - 100 VPD	4 031	3 173	2 874
100 - 200 VPD	4 791	4 104	3 760
200 - 400 VPD	6 514	5 147	4 854
Earth Roads			
0 - 10 VPD	473	416	362
10 - 30 VPD	678	567	477
30 - 60 VPD	972	790	678
60 - 100 VPD	1 225	918	844

Overhead and profits must be added to the above costs for contracting works.

Units Costs are from Annexes 3.3.3/2 and 3.3.3/3 of the Draft Final Report.

1.3 Forecasted Situation 1982

The Consultant has made a forecast for 1982 by taking into account outside assistance already granted and the changes that have taken place over the past years.

a) 1982 Road Network

The change in the network between 1977 and 1982 was established on the basis of the project already underway (in improvement and new construction) and projects already planned (with or without financing). The P.W.D. will be maintaining a network of 1,270 kilometers (730 kilometers of paved roads and 540 kilometers of gravel roads). The following table summarizes the road network changes by road type :

P.W.D. Network	1977		1982	
	kms	%	kms	%
Paved Roads	304	10.3	558	18.8
Gravel Roads	528	17.8	712	24.1
Ordinary Network				
Feeder Roads - All Weather	1 696	57.3	1 521	51.4
Feeder Roads - Dry Weather	432	14.6	169	5.7
Total	2 960	100%	2 960	100%

b) Personnel

The Consultant assumes that the approved establishment of the various branches of the P.W.D. involved in highway maintenance will be reached, that is, that all vacancies will have been filled by 1982.

c) Equipement

It is assumed that existing equipment after scrapping and with the addition of UNSCO equipment will be in use until 1982.

d) Financial Resources

A growth rate of 10% was used for the budget forecast. Table 1.3 summarizes the budgets from 1976/77 to 1981/82.

TABLE 1.3

BUDGET FORECAST 1977-82
(000 Dalasis)

1976/77	1977/78	1978/79	1979/80	1980/81	1981/82
1,951	2,146	2,361	2,597	2,857	3,142

e) Planning

An integrated land and water transport study is about to start. The results will be available for planning purposes at the end of 1978.

1.4 Economic Analysis

The objective of the present study's economic analysis has been to evaluate the maintenance alternatives in order to optimize the use of scarce available resources by the proposed program.

a) Vehicle Operating Costs

Data on vehicle operating cost are lacking in the Gambia, although they will soon be determined in the integrated transport study. In the meantime, the Consultant has used the vehicle operating costs derived in the economic analysis for Senegal. It was assumed that traffic characteristics by road type and surface condition in the Gambia are the same as those in Senegal and that the weighted average operating costs are therefore the same. These costs are summarized in the following table :

Vehicle operating costs (in Dalasis/km)

Road Type	Surface Condition 4 (Very good-good)	3 (Fair)	2 (Bad)	1 (Very bad)
Paved	0,474	0,541	0,742	1,072
Gravel Road	0,740	0,830	1,102	1,556
Earth Road	0,925	0,987	1,231	1,639
Improved Track	1,523	1,654	2,047	2,702

The aggregate fleet operating costs could not be determined for the Gambia because the necessary traffic data were not available.

b) Maintenance and Rehabilitation Threshold Analysis

Thresholds were determined by comparing maintenance and rehabilitation costs to benefits (savings in operating costs). The traffic level of this break-even point is the threshold above which it is justified to rehabilitate and/or maintain.

The traffic thresholds corresponding to the various optimal maintenance levels were determined by comparing maintenance costs differentials to operating cost differentials.

Optimal Maintenance by Road Type and Traffic Ranges

Road Type	Traffic 0-10	10-30	30-60	60-100	100-200	200-400
Paved Road	-	-	Min.	Int.	Good	Good
Gravel Road	-	Min.	Int.	Int.	Good	Good
Track	Int.	Int.	Good	Good	-	-

It was assumed that rehabilitation will be carried out by contractors. Taking into account all appropriate costs, the earth road rehabilitation traffic thresholds are summarized in the following table.

Rehabilitation Threshold for Gravel Roads

Average non-maintained condition in case of non-rehabilitation (*)	1.5	1.6	1.7	1.8	1.9	2.0
Traffic threshold (12% discount)	31	35	39	44	48	52

1.5 Rehabilitation Requirements

Within the framework of the IBRD/IDA highway maintenance project, a Backlog Maintenance Program has been elaborated which would amount to about two million US Dollars.

1.6 Maintenance Requirements

a) Immediate requirements

Immediate needs (for 1978-79) concern the maintenance of the network under the P.W.D. : 304 kilometers of paved roads and 528 kilometers of gravel roads.

b) Medium-term requirements

In 1982, the network will be 558 kilometers of paved roads and 712 kilometers of gravel roads, the increase resulting from scheduled improvement works.

1.7 Aggregate Resource Requirements

a) Organisation

The present reorganization will have to be finalized in the light of the final recommendations of the Road Maintenance Study for Gambia.

(*) Indices vary from 1 (very bad) to 5 (excellent).

b) Equipment and Workshops

The additional equipment needs concern the new purchases necessary to make up for the shortage of existing equipment. The 1978 purchase is the most important, reaching 1.5 million Dalasis ; for the years 1979, 1981 and 1982, purchases will be 0.17, 0.17, and 0.10 million Dalasis.

Based on meetings with Public Works officials, the Consultant recommends that a new workshop (with appropriate tools and tooling) be constructed in Banjul for maintaining the 500 units of the equipment and vehicle fleet, including the fleet of other ministries.

The workshop construction cost will be 1.92 million Dalasis. The workshop will be equipped with tools and tooling costing 0.63 million Dalasis including freight and insurance.

In order to start the program, it is also necessary to have during the first year sufficient spare parts to repair the existing fleet. The budget for these spare parts, 0.47 million Dalasis (1977 prices), must be available in 1978.

c) Personnel

Worker needs were derived from workload needs. It is recommended that a Production-Formation Brigade (PROFOR) be created in order to retrain the existing personnel and undertake future training needs. A PROFOR workshop should also be set up on the workshop site.

The technical assistance needs concern the creation of a PROFOR brigade and workshop and the supply of three training specialists. The cost of the technical assistance will be 2.6 million Dalasis in current prices for five years. The training portion cost of the PROFOR budget will be 0.80 million Dalasis in current prices for the same period.

d) Financial Resources

The annual budget covering maintenance needs is summarized in Table 1.4. The foreign exchange amount for each item is indicated in parentheses.

The foreign exchange needs including investment amount to 28.4 million Dalasis (current prices), equivalent to 12.13 million U.S. Dollars for the five years.

1.8 Analysis of Constraints

Comparing maintenance needs with available resources shows a considerable budget gap. The needs for the five years will be 39 million Dalasis (current prices), or about 300% of available resources.

In order to solve the budget deficit, the Consultant proposes that outside financing pay for the operation of the production part of the PROFOR brigade and the renewal of equipment and spare parts. The remainder of the deficit should be financed by a road fund, which could come from the taxes on petroleum products sold to road users.

For personnel training, it is proposed that outside financing cover the cost of three training specialists.

1.9 Proposed Program

a) General Description

The program period is divided into two parts : the immediate phase and the final phase. The annual costs of the program are shown in Table 1.4. The immediate phase corresponds to the immediate program in the Consultant's Interim Report, which has been updated by taking into account the rehabilitation work already scheduled under other projects.

b) Immediate Phase

For 1978, the program consists of road maintenance works, the purchase of equipment, the construction of a workshop and the purchase of its tools and tooling, and the purchase of spare parts. The cost of the program will be 9.76 million Dalasis, or 4.17 million U.S. Dollars (current prices without taxes).

For 1979, the second year of the immediate phase, 5.65 million Dalasis, or 2.41 million U.S. Dollars, will be spent on maintenance, equipment, the PROFOR brigade, and technical assistance.

c) Final Phase

During the final program period, only the maintenance activities, equipment purchase, training, and technical assistance will be continued.

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Table 1.4

ANNUAL BUDGET OF PROPOSED PROGRAM

(Millions of Dalasis (1977 w/o tax)

	1978	1979	1980	1981	1982	Total
Operating budget	3.44	3.88	4.34	4.81	5.29	21.76
(foreign currency)	(2.41)	(2.72)	(3.04)	(3.37)	(3.70)	(15.23)
Investment budget						
Equipment & work-shops (1)	4.82 (4.02)	0.17 (0.17)	- -	0.17 (0.17)	0.10 (0.10)	5.26 (4.46)
Technical assistance and training	0.62 (0.46)	0.62 (0.46)	0.45 (0.33)	0.45 (0.33)	0.45 (0.33)	2.59 (1.91)
Total (foreign currency)	5.44 (4.48)	0.79 (0.63)	0.45 (0.33)	0.62 (0.50)	0.55 (0.43)	7.85 (6.37)
Total budget						
Constant dalasis (foreign currency)	8.88 (6.89)	4.67 (3.35)	4.79 (3.37)	5.43 (3.87)	5.84 (4.13)	29.61 (21.60)
Current dalasis (foreign currency)	9.76 (7.58)	5.65 (4.05)	6.37 (4.48)	7.93 (5.65)	9.40 (6.65)	39.11 (28.41)

(1) Including equipment, spare parts (1978), buildings & tools.

(2) Includes the PROFOR training brigade.

The financing will be distributed in the same manner as it was for the immediate phase.

d) Conclusions

The aggregate cost of the program is 39.11 million Dalasis, or 16.71 million U.S. Dollars. The foreign currency portion is 28.40 million Dalasis, or 12.13 million U.S. Dollars.

It is recommended that the financing of the operating budget be divided between the forecast budget, outside funds, and the proposed road fund. Table 1.5 summarizes this distribution. The investment needs must be entirely taken up by outside financing.

The residual value of the proposed program at the end of 1982 will be 4.035 million Dalasis. The internal rate of return of the program will be 16%.

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Table 1.5

LOCAL AND FOREIGN FUNDING OF OPERATING BUDGET

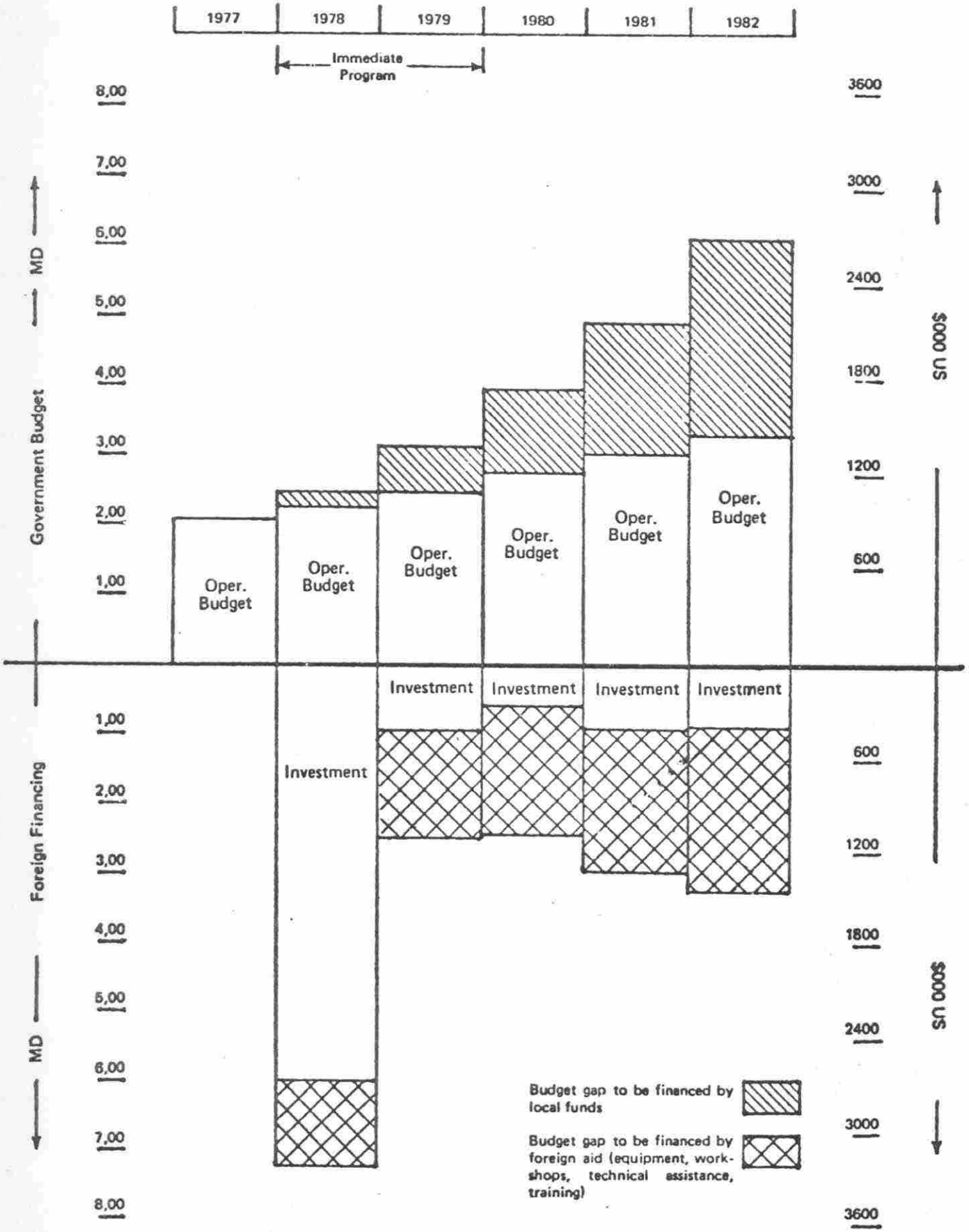
(Millions of current Dalasis - w/o tax)

	1978	1979	1980	1981	1982	Total
Maintenance budget (US $)	3.78	4.70	5.77	7.02	8.51	29.78 (12.73)
Available resources (US $)	2.21	2.43	2.67	2.94	3.24	13.49 (5.76)
Budget gap (US $)	1.57	2.27	3.10	4.08	5.27	16.29 (6.96)
Gap to be financed by a national road fund (US $)	0.25	0.71	1.28	1.98	2.84	7.06 (3.02)
Gap to be financed by foreign aid (1) (US $)	1.32	1.56	1.82	2.10	2.43	9.23 (3.94)

(1) The production section of the PROFOR brigade, which can be considered as an investment. The numbers have been adjusted for the calendar year.

FIGURE 1.1

FINANCING PLAN OF PROPOSED PROGRAM



2. MISCELLANEOUS

2.1. Secondary roads studied under UNSO financing

The present status of financing of the secondary roads studied under UNSO financing is specified in Table 2.1. If the present negotiations with the West German Government are successful, full financing will have been achieved.

2.2. National Training Program

This program will be detailed in the forthcoming Road Maintenance Study for the Gambia. The Government has not yet elaborated a definite national training program, but mentionned the following points :

In particular, the development of the Technical Institute (presently V.T.C. Vocational Training Center), financed by the Worl Bank will have to be considered.

There are presently a number of Gambian students in engineering completing their final studies abroad. (9 in all, of whom 2 would be in Civil Engineering and 2 in Mechanical Engineering). It will probably be necessary to build a new building providing two class rooms and training workshop.

2.3. Preliminary Estimate of IBR/IDA Highway Maintenance Project

This estimate is given in Table 2.2.

It should be noted that estimates of backlog maintenance costs are on the order of two million Dollars.

2.4. Corrections

Following the Government's comments, a number of corrections have been incorporated into the following tables, which would replace some of the tables of Chapter 3.2 through 3.10 of the Draft Final Report.

The following comments apply to the tables presented hereafter.

G A M B I A

Table 2.1

UNSO STUDIED ROADS WITH FINANCING STATUS

No	LINKS/TRONCONS	LENGTH/ LONGUEUR	FINANCING STATUS/ ETAT FINANCEMENT
1	Laminkoto-Wuli-Fatoto	140.1	Lybia (studies only)
2	Farafenni-Balingtho	10.8	UNSO
3	Banni-Salikenye-N'ja Kunda	15.8	UNSO
4	Buniadu-Albadarr-Sika	30.0	FED
5	Basse-Fatoto	39.7	UNSO
6	Sotuma-Gambissara (nr Basse)	6.7	UNSO
7	Choya-Dankuku-Jessa di Tenda (in the Mac Carthy Island Region)	20.5	UNSO
8	Soma-Sankwia (nr Mansakonko)	6.4	UNSO
9	Sankandi-Keneba-Karantaba-Kenneto	48.3	West Germany (under negociation)
10	Kwinella-Tendaba	5.0	UNSO
11	Manduar-Tankular-Jali-Kuli Kunda	24.0	West Germany (under negociation)
12	Kenneba-Bintang Bolon River	3.5	West Germany (under negociation)
	Total	350.8	

Source : CILLS Document n° RAF 401-Gambia, Secondary Road Construction and Maintenance Program - Phase II.

Table 2.2

IBRD/IDA HIGHWAY MAINTENANCE PROJECT - THE GAMBIA

REVISED ORDER OF COST - ROUGH ESTIMATE

MARCH - 1978

	Foreign Million US $	Local Million US $	TOTAL Million US $
1. Technical Assistance			
for Road Maintenance (Training)	1.98	0.22	2.2
2. Equipment Purchase			
a) Rehabilitation Brigade	1.26	-	1.26
b) Bituminous Works	0.22	-	0.22
c) Workshop	0.22	-	0.22
d) Materials Laboratory	0.28	-	0.28
e) Traffic Counters and Office Equipment	0.02	-	0.02
Sub Total	2.00	-	2.00
3. Bakclog Maintenance	1.40	0.60	2.00
4. Studies			
a) Project Preparation	0.08	0.02	0.10
b) Pre-investment	0.32	0.08	0.40
Sub Total	0.40	0.10	0.50
Total 1 + 2 + 3 + 4	5.78	0.92	6.7
Contingencies	0.4	0.18	0.58
Grand Total	6.18	1.1	7.28
Say	6.2	1.1	7.3

Table 3.2.3/1 Budgetary Expenditures

Corrected to take into account last direct maintenance figure and new allocation of personnel time.

Table 3.2.3/2

First column revised to reflect July 1977 situation.

Table 3.2.3/3

A note added.

Tables 3.2.3/4 and 3.2.3/5

Second column corrected to give exact expatriate personnel figure.

Tables 3.2.3/6 and 3.4.1/1

Tables revised not to take into consideration paving of the Kerewan - Laminkoto road.

Table 3.8.3

First three columns corrected to take into account 1978 situation

Figure 3.2.2/1

Figure corrected to show Selety - Mandinaba as a primary road and Yorrobawal - Fatoto - Basse as a secondary road.

Annexes 3.8.3/2 and 3.8.3/3

Figures corrected.

G A M B I A

Table 3.2.3/1

BUDGETARY EXPENDITURES

(000 Dalasis)

Designation	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77
Direct Maintenance	598	534	621	805	1 110	1 586
Part of personnel budget for maintenance (40%)	118	118	134	144	102	307
Part of miscellaneous charges for maintenance (26%)	15	51	10	12	14	21
TOTAL current budget	731	703	765	961	1 286	1 914
Percent growth		-4%	+9%	+26%	+34%	+49%

G A M B I A

Table 3.2.3/2

INVENTORY OF PUBLIC WORKS EQUIPMENT ADMINISTERED BY TRANSPORT BRANCH

DESIGNATION	EXIST. July 77	(1) UNSO
Bulldozer	4	2
Grader	8	2
Loader	9	2
Crane	2	-
Dump Truck	8	7
Tandem Roller	10	-
Vibrating Roller	9	1
Crusher	4	-
Asphalt Distributor	2	-
Compressor	3	-
Pumps	6	2
Concrete Mixer	19	2
Generator	0	-
Pneumatic Roller	1	1
Water Truck	2	4
Flat-bed Truck	-	3
Semi-Trailer	-	1
Fuel Trailer	-	1
Mobile Workshop	-	1
Fuel Truck	-	1
Pick-up	3	4
TOTAL	90	34

(1) Delivery expected by end of 1977.

G A M B I A

Table 3.2.3./3

INVENTORY OF EQUIPMENT BELONGING TO OTHER BODIES BUT ADMINISTERED BY TRANSPORT BRANCH

Designation	Number
Presidential limosines	7
Car pool	25
V.I.P. cars	2
Land Rovers	129
Other cars	40
Miscellaneous trucks	104
Bus	7
Tractors	11
TOTAL	325

Note : A further 141 cars have been registered since this inventory was made.

G A M B I A

Table 3.2.3/4

LISTING OF PERMANENT EXISTING PERSONNEL : CIVIL SERVICE BRANCH

July 1977

Designation	Gambian	Expatriate	TOTAL
Chief executive engineer	1		1
District chief		2	2
Highway engineer		0	0
Material engineer		0	0
Project engineer		0	0
Executive engineer		1	1
Laboratory technician	1		1
Assistant engineer	1		1
Chief supervisor	5		5
Assistant supervisor	1		1
Sr. field supervisor	1		1
Assistant field supervisor	17		17
Assistant technical supervisor	1		1
Foreman	3		3
Assistant foreman	2		2
Draftsman	1		1
Skilled worker	3		3
Clerk	7		7
Messenger	2		2
Carpenter	1		1
Apprentices	30		30
TOTALS	77	3	80

Sources : Estimates of Revenues and Expenditures with Development Expenditure 1975-1976. Interview with the Public Works Department.

G A M B I A

Table 3.2.3/5

LISTING OF PERMANENT EXISTING PERSONNEL : TRANSPORT BRANCH

July 1977

Designation	Gambian	Expatriate	TOTAL
Chief mechanical engineer	1		1
Senior mechanical engineer		1	1
Workshop supervisor	6		6
Assistant workshop supervisor	2		2
Foreman	6		6
Assistant Foreman	4		4
Chauffeur	185		185
Equipment operator	95		95
Skilled worker	140		140
Apprentice	12		12
Accountant	1		1
Bookkeeper	3		3
Clerk	5		5
Messenger	1		1
TOTAL	461	1	462

Sources : Interview with the Public Works Department.
Estimates of Revenues and Expenditures with Development Expenditures 1975/76.

Note : These personnel operate and maintain not only the maintenance equipment but also all of the vehicles and equipment managed by Transport Branch.

G A M B I A

Table 3.2.3/6

PROJECTS PROGRAMMED OR IN PROCESS

Class	Links	Length	Observation
P.R.	Soma - Basse	200	Paving recommended
"	Essau - Kerewan	54	"
"	Laminkoto - Fatoto	135	Gravelling recommended
"	Fatoto - Basse	40	"
F.R.	Kerewan - N'Jawara	10	Projects CILSS
"	Banni-Salikene-N'Jabakunda	16	"
"	Farafenni - Balingho	11	"
"	Dippakunda - Bambali	20	"
"	Ngeyen-Sanjal-Sarakunda	8	"
"	Soma - Sankwie - Tonda	6	"
"	Kwinelli - Tondaba	5	"
"	Choya - Dankunku - Jessadi	20	"
"	Sotuma - Gambissara	7	"
"	Kundum-Kulari-Sajakunda	17	"
"	Kiang West Roads	87	Bilateral aid project
"	Buniadu - Kuntair	56	"
	TOTAL	692	

Source : Interview at the Public Work Department.

Note : P.R. = Principal Road.
F.R. = Feeder Road

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Table 3.4.1/1

ASSUMPTIONS ON THE CHANCES OF THE ROAD NETWORK
(Kilometers)

Links	Length	Paved	Gravel	Ordinary earth	Dry-weath.	Observations
Soma - Basse	200	+ 200	- 200			Paving recommended
Essau - Kerewan	54	+ 54	- 54			
Laminkoto - Fatoto	135		+ 135	- 135		
Fatoto - Basse	40		+ 40	- 40		Gravelling recommended
Kerewan - N'Jawara	10		+ 10		- 10	"
Banni-Salikene-N'Jabakunda	16		+ 16		- 16	"
Farafenni - Balingho	11		+ 11		- 11	"
Dippakunda - Bambali	20		+ 20		- 20	"
Ngeyen-Sanjal-Sarakunda	8		+ 8		- 8	"
Soma - Sankwie - Tonda	6		+ 6		- 6	"
Kwinelli - Tendaba	5		+ 5		- 5	"
Choya-Dankunku-Jessadi	20		+ 20		- 20	"
Sotuma - Gambissara	7		+ 7		- 7	"
Kundam-Kulari-Sajakunda	17		+ 17		- 17	"
Kiang West Roads	87		+ 87		- 87	"
Buniadu - Kuntair	56		+ 56		- 56	"
Change 1977-82		+ 154	+ 184	- 175	- 263	
Network 1977		304	528	1.696	432	
Network 1982		558	712	1.521	169	

Source : Interviews with P.W.D. officials

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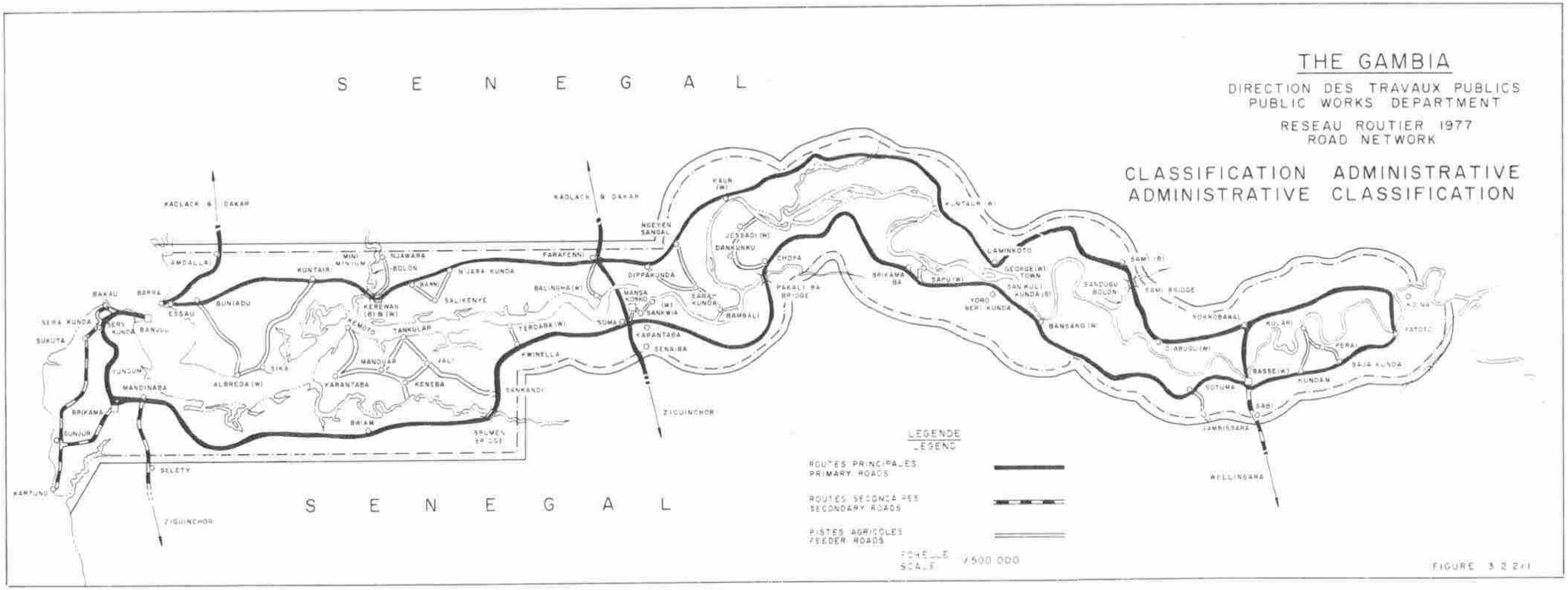
Table 3.8.3

PERSONNEL REQUIREMENTS

CATEGORIES	1978	1978		1979		1980		1981		1982		77/82
	Exis.	Need	Train.	Need	T.	Need	T.	Need	T.	Need	T.	T.
MANAGEMENT												
District engineer												
Subdivision engineer	2	3	1							3		
Deputy sub. engineer	1	3	2							3		
Sector chief												
Accountants	0	4	4							4		
Buyers	0	2	2							2		
Store keepers	4	4	0							4		
Pointers	6	6	-							6		
Secretaries	12	12	-							12		
Training spec.	0	1	1							1		1
EQUIPMENT												
Equipment inspector												
Equipment controller		2	2							2		
Workshop supervisor	3	13	10							13		5
Crew	15	18	3							18		3
Mechanics	25	46	21							46		21
Assistant mechanic	28	50	22							50		22
Electricians	2	4	2							4		2
Injection spec.	1	2	1							2		1
Machine tool workers	4	8	4							8		4
Other workers	14	16	2							16		2
PRODUCTION												
General foremen	5	2								2		
Foremen and cantonniers	18	30	12							45	15	27
Operators		15								20	5	5
Field lubricator		3								4	1	1
Drivers		39								68	29	29
Specialized workers	2	5	3							7	2	5
Field chief mechanics												
Field mechanics	5	3								4		
Assistant field mechanics	5	4								6	1	1
Service station attendants		1								1		
Service station lubricators												
Mechanics-service station												
Service station assistant mechanics												


THE GAMBIA
DIRECTION DES TRAVAUX PUBLICS
PUBLIC WORKS DEPARTMENT
RESEAU ROUTIER 1977
ROAD NETWORK
CLASSIFICATION ADMINISTRATIVE
ADMINISTRATIVE CLASSIFICATION
SENEGAL
SENEGAL
KAOLACK & DAKAR
KAOLACK & DAKAR
ZIGUINCHOR
ZIGUINCHOR
WELLINGARA
BANJUL
BAKAU
BARRA
ESSAU
BRIKAMA
FARAFENNI
SOMA
MANSA KONKO
KAUR (W)
KUNTAUR (W)
GEORGE (W) TOWN
BANSANG (W)
BASSE (W)
LEGENDE
LEGEND
ROUTES PRINCIPALES
PRIMARY ROADS
ROUTES SECONDAIRES
SECONDARY ROADS
PISTES AGRICOLES
FEEDER ROADS
ECHELLE
SCALE
1/500 000
FIGURE 3.2.2/1

GAMBIA

Annex 3.8.3/2

EQUIPMENT AND PERSONNEL NEEDS - 1977

Item	Total days	Units 200d/yr	Clearing	Drainage clearing	Culvert clearing	Small repairs of structures	Signals	Temp... patching	Perm. patching	Gravel road patching	Shoulder repairs	Mechanical clearing of ditches	Anti-corrugation	Heavy reshaping	Resurfacing	Excavati loadir haulin
Number of days			568	2080	144	129	95	91	114	616	76	139	211	158	44	102
Cantonnier	3297	16	568	2080	144	129	95	91	114		76					
Pick-up	3601	18	568	2080	144	129	95	91	114		76			158	44	102
Laborer	42794	214	5680	20800	1440	1290	950	910	1140	6160	760	556	844	632		1632
foreman	1488	7				129	95	91	114	616		139		158	44	102
Truck	840	4				129	95			616						
Compressor	954	5				129	95		114	616						
Specialized laborer	672	3				387	285									
Asphalt distributor	205	1						91	114							
Vibrating roller	205	1						91	114							
Dump truck	1134	6							114							1020
Steel roller	360	2							114					158	88	
Semi-specialized laborer	454	2							454							
Water truck	938	5								616	76			158	88	
Hand vibrator	1232	6								1232						
Grader	814	4										278		316	220	
Pneumatic roller	322	2									76			158	88	
Lubricating trailer	348	2							114		76			158		
Agricultural tractor	422	2											422			
Pump	44	1													44	
Fuel truck	44	1													44	
Workshop truck	44	1													44	
Service truck	44	1													44	
Loader	102	1														102
Bulldozer	102	1														102

GAMBIA

Annex 3.8.3/3

EQUIPMENT AND PERSONNEL NEEDS - 1992

Item	Total days	Units 200d/yr	Clearing	Drainage clearing	Culvert clearing	Small repairs of structures	Signals	Temp. patching	Perm. patching	Gravel road patching	Shoulder repairs	Mechanical clearing of ditches	Anti-corrugation	Heavy reshaping	Resurfacing	Excavation loading, hauling
Number of days			1000	3175	273	237	201	219	274	630	183	212	216	162	45	104
Cantonnier	5607	28	1000	3175	273	237	201	219	274		183				45	
Pick-up	6237	31	1000	3175	273	237	201	219	274	630	183				45	104
Laborer	65816	329	10000	31750	2730	2370	2010	2190	2740	6300	1830		864	648	720	1664
Foreman	2084	10				237	201	219	274	630		212		162	45	104
Truck	1068	5				237	201			630						
Compressor	1342	7				237	201		274	630						
Specialized laborer	1314	7				711	603									
Asphalt distributor	493	3						219	274							
Vibrating roller	493	3						219	274							
Dump truck	1449	7							274						135	1040
Steel rollers	526	3							274					162	90	
Semi-specialized laborer	1096	5							1096							
Water truck	1110	6								630	183			162	135	
Hand vibrator	1260	6								1260						
Grader	973	5										424		324	225	
Pneumatic roller	435	2									183			162	90	
Lubricating trailer	345	2									183			162		
Agricultural tractor	432	2											432			
Pump	45	1													45	
Fuel truck	45	1													45	
Workshop truck	45	1													45	
Service truck	45	1													45	
Loader	104	1														104
Bulldozer	104	1														104

3. GOVERNMENT'S COMMENTS

Ref : KM/40586

Public Works Deparment,
Banjul,
The Gambia

25th March, 1978.

Executive Secretary,
CILLS
Boite Postale 7049
Ouagadougou,
Haute Volta

Dear Sir,

ROAD MAINTENANCE DIAGNOSTIC
STUDY - DRAFT FINAL REPORT
VOLUME 3 - THE GAMBIA

Please find enclosed a copy of comments on the above report.

Please accept, Sir, the assurance of our highest consideration.

DIRECTOR OF PUBLIC WORKS
FOR TRANSPORT GROUP REPRESENTATIVE

c.c. Louis Berger
Boîte Postale 3114
Dakar
Senegal

ROAD MAINTENANCE DIAGNOSTIC STUDY FOR THE SAHEL
DRAFT FINAL REPORT - VOLUME 3 THE GAMBIA
BY LOUIS BERGER INTERNATIONAL, INC.

INTRODUCTION

The English version of the Draft Final Report was received by Public Works Department on 28 February, it is dated July 1977. A number of inaccuracies are observed which may affect the conclusions. Some of these are probably typing or translation errors but some appear to be interperative. The Report data was collected during 1976 and early 1977 and some changes have been effected since then which are not considered likely to be contrary to the report findings.

COMMENTS

1. In general the report indicates a greater input to road maintenance than has been possible prior to July 1977, in subsequent discussions it is realised that this is due to the shortage of factual records on which the consultants could base their information. However there has been an unfortunate confusion of "cause" and "effect" which does not give full credit for effort with the reduced facilities available ; a typical example can be found at paragraph 3.9.3 (page 3-70) which would be more truthfully written.

3.9.3. Equipment Constraints

The equipment fleet has been inadequate in numbers for a number of years to efficiently carry out maintenance works along with other work it is called upon to perform. This has led to its being over used, leaving little time for its proper maintenance. 65% of the equipment is over 10 years old having performed considerably more working hours than this period indicates, this has thrown an impossible burden on the few competent mechanics available and made spare parts procurement more difficult".

The above is much more analytical than the working of the paragraph in the Report.

2. On the other hand the "Equipment and Personnel Needs" for 1977 listed at Annex 3.8.3.3./2 (page 3-101) appear less than were actually available and (presumably) used in 1977. Table 3.8.2/1 (page 3-56) gives surplus equipment for most items - 96 items available, 53 items needed in 1978. From which a logical conclusion would be to get rid of 43 items of equipment (Net) leaving adequate space in the workshops to maintain the reduced fleet, obviously this conclusion cannot be correct or there would be no need to expand D40 million on road maintenance. There are many instances of conflicting statements in the draft report the page by page comments follow.

3. Pages 1, 2, 3.

It is of no revelance but there is no distillery, shoe or perfume factory. To preserve the technical grading "Feeder roads" should read "Earth roads". Sometime, somewhere a road Consultant in the Gambia must get down to the definition of "a road" and an "all weather road" it is suggested that a start could be made on a report such as this in the Introduction to say "The topography in most of the Gambia is flat or rolling ; in the long dry season vehicles can travel over the Savannah in very many routes without the benefit of a formed road, in a number of areas the vehicle formed cross country tracks are navigable during the short wet season, even without drainage structures. An "all weather road" is one which is reckoned to have provision of drainage structures adequate to allow the passage of two wheel drive vehicles throughout the whole of the annual weather cycle". The Macchi Valli report to UNSO has produced an acceptable standard for this road in Gambian conditions, it is believed to be "maintainable" by recognised methods and "trafficable" without deviation from the designed and constructed alignment. Where travel is possible by a few vehicles per year by periodic deviation from the original route maintenance may not be necessary or economic and the track need not included in a formal road register. When the above expedient is no longer possible the route should be a "dry weather road" until such time as adequate drainage structures are provided for higher classification. The routes mentionned above would not be "private roads" to individual holdings. The above concept could be fitted in to the "threshold" concept later in the report. The rather patronising remarks on traffic counts and road inventory are not diagnostic, comments have been made on the inception report. The Public Works Department three Head Quarter branches have only a support function in the departments implementation programme there is no evidence that the consultants made any contact with the three divisions where first hand information on road maintenance was available the consultant for the transport study and World Bank maintenance study are doing this obviously essential exercise. Departmental organisation at March 1977 and March 1978 are attached.

4. Page 4

The statement that there is no tool inventory is untrue, all machine tools are registered and numbered in the series "W.S.E. n°.....",this indicates quantity,location and age. The phase "Book keeping is not detailed" can hardly be called useful advice. The second paragraph is incorrect, it should read "The 1977 approved establishment of the mechanical and civil engineering branches etc..." very many (probably most) Civil Services in the developing world have vacancies in their establishments. The third paragraph on expatriate management staff is also incorrect in fact the numbers in MARCH 1978 are five and one ; the management organisation charts for March 1977 and March 1978 attached gives the true picture and the figure of 14 vacancies out of a total of 26 senior management is a very significant aspect of the whole study, a point which the consultants have completely missed. Periodic maintenance is carried out to the limits of the facilities available. In order of significance the constraints which the Gambia Government is making valiant efforts to overcome are :

a) A desperate shortage of skilled and experienced management staff.

b) Complete lack of hard rock or stone in the country.

c) Shortage of accessible water (an important commodity in road construction and maintenance and a constraint common throughout the Sahel).

d) Inadequate available equipment hours.

e) Shortage (but not a complete lack of) skilled man power - Training.

f) Budget.

In spite of constraints the report does not, anywhere give the consultants opinion of the standard or degree of road maintenance in the Gambia. All our other consultants (6 othersworking on road assignments) and the funding agencies (6 or 8) have stated their unbiased, considered opinion on this matter. Equipment is old, also where in the report it is stated that 65% is over 10 years old, in fact some items are 25 - 34 years old, if it is still in production (available for work),can it possibly be "badly maintained" ? Equipment is certainly over utilised and with better facilities maintenance could certainly be improved. Complete anarchy does not reign in the Gambia. The data is available but it has not been abstracted to a form to

to suit particular consultants, other consultants have taken care to do this. The phrase "Bookeeping does not exist" conflicts with the first paragraph on this page which indicates that it does exist but is "not detailed". The consultants experience "in the area" for determining maintenance tactics could be faulty when applied to The Gambia which may have some unique features.

5. Page 5

The table of costs will need further study but it appears to have some anomalies - as written there would appear to be a "traffic barrier" beyond which a gravel road would be cheaper to maintain than a paved road if the aim were "Good" or "intermediate" standard but for "Minimum" standard it would be cheaper to have a pavement on traffic over 75 V.P.D. (say). The "break even" point for paving over gravel appears to be even lower than anticipated, it was"guessed" at 150 - 200 V.P.D. for The Gambia (lower than the normal) but with maintenance being less at 60 - 90 V.P.D. the economic paving time could be at a traffic volume of less than 150 V.P.D. The problem needs more study, it would have been useful to have the consultants gravel road maintenance figures beyond 200 V.P.D.,the tables entry 200 + could be misleading.

6. Page 6

The total length of road shown in the table 2960 kms is unchanged at 1982 i.e. no NEW construction all IMPROVEMENT UPGRADING or in the consultants language rehabilitation. All the work was initiated and progressed by P.W.D. (see later). Since the report was compiled a number of changes have taken place in the personnel of P.W.D. and as stated above there are still senior vacancies to be filled. To assume that the existing equipment will still be in use in 1982 when the report has previously stated that it was "poorly maintained" does not appear to be very sensible - an item of equipment which went into services in 1948 will be 34 years old in 1982.

7. Page 7

It is not clear what is the unit or rate in the table. Is it CFA per kilometer ? Also vehicle under-utilisation for The Gambia is a doubtful statement.

8. Page 8

Paragraph 3.1.5 is offensive.

9. Page 9

Paragraph 3.4.6 (b) does not appear to comply with the statement in paragraph 3.15 !!! On organisation one of the responsibilities of the divisional highway engineer could be "Each divisional highway engineer shall examine, analyse and comment on consultants Draft Final Reports as they affect highways in their particular division", now since there are No highway engineers at post the consultants would wait for a long time before they got their comments. Is this point now taken ? It appears to have escaped the consultants. To put it bluntly - if the writer was not now doing the work of the non-existant highway engineers, he would be writing what the existing highway engineer should be doing. So, the department is building up deficient staff vacancies, reduced from 53.8% to 26.7% in the past years.

10. Page 10

The five year budget will require more study, on first observation it appears to be beyond the national means and credit but the table is useful. Existing budget inputs will require adjustment (see later).

11. Page 17

It may be a little pedantic but many of the roads have been officially classified under the "Sixth Schedule of The Motor Traffic Regulation" in the Laws of The Gambia and the schedule's later ammendments. This is a legal and administrative classification - Class I, II and III as shown on the official Gambia Road Map. However it is accepted that classification should be revised and the two form, three tier classification used in the report is more descriptive, it is suggested that the term "Feeder Road" be an administrative classification only and the "Technical standards" classification be "Paved", "Gravel and Earth" and the administrative classification be "Primary", "Secondary' and "Feeder". These classifications agree with the legends on the two maps, the minor alterations to the maps have been discussed with the consultants representative.

12. Page 19

The standards proposed may be on the high side for paved roads and low for feeder roads - a 12 meter platform makes for expensive culverts, a 3.5 meter road may be difficult to maintain, for Gambian topography maximum gradients above 3% and 5% would not be unacceptable. The standards given in the UN ECA Rural Roads Study appear more practical. On traffic statistics this particular physician has diagnosed "you would be in much better health if you were not suffering from mal nutrition". He has not said WHY the patient is under nurished far less suggest a cure. Traffic forecasts have been made by other consultants with and without the P.W.D. bi-annual counts. The very careful census and O & D surveys carried out for the Intergrated Transport Study are also producing anomalies which indicate that previous censuses have some merit. The patient has made a self-diagnosis (and is also affecting the cure !!) There is a Road Register. The consultant has not got on the "Sahelian Wavelength" Any body in The Gambia knows that if drainage structures are clear in October and vegetation on verges is out it just a'int gonna rain till next June,no water is going to flow through the culverts and no grass is going to grow until then. There does not appear to be much difference in qualifying road condition 1, 2, 3, 4 and 5 against bas, poor, fair, good, and very good, or Good = 3.5,Intermediate = 3.2 and Minimum = 2.9. The impression given in the Draft Report by this paragraph is that no work is being done on road maintenance and that an analysis of surface condition in May 1977 would hold good for March 1978. The facts are that the absolute condition of a road or road system could be much better in March 1978 than May 1977 but there coult be relative gradual deterioration over a period of years.

13. Page 21

It is fairly obvious that the consultants were given the information on the proposed re-organisation of P.W.D. and the degree of implementation but they have completely mis-interpreted it. The Civil Engineering Branch of the Headquarters Organisation does very very little direct road maintenance. The departments divisions are responsible for building construction by force account and contractor, all building maintenance, supply and maintenance of furniture and equipement to Government installations, river wharves, ferry ramps, rural water supplies, drainage, sea defence and other maritime works, airfield maintenance. All road construction including "private" roads (P.W.D. are the only organisation with bitument capability), celebration arrangements, quarries shell deposits crushing and screening, they also do

about 99% of all the road maintenance that is carried out in The Gambia. Of the total time of the Civil Engineering Branch (H.Q. and the Divisions) not more than 30% could be devoted to road maintenance - probably nearer 20% until each division has a highway engineer. The Mechanical branch devotes about 20% of its effort to road maintenance (Maximum) probably 15% until the senior mechanical engineer posts are all filled. Although not quite to the same degree as it was to mid 1976 road maintenance activities are still over centralised, the reasons for this are staff shortage, accomodation shortage outside of Banjul, contrast in living conditions away from the coast, workshop, stores and office shortage outside of Banjul. Plans programmes, instructions and directives from a center are going to be pretty useless (they have in the past been hopeless) if the necessary facilities are not available to carry them out ; Gambias battle on road maintenance will be fought and won (it is being fought, it is showing signs of being won) in the field, a return to centralisation will mean a return to hopelessness, dejection, lack of dedication and the following 1975 Style vicious circles :

a) No fuel in the provinces :

   Storekeeper "The roads are so bad the fuel transporters refuse to go up there".

   P.W.D. "We cannot repair the roads without fuel for the equipment".

b) We need a bulldozer at Bansang !
   Workshop Manager "The road is too bad to take the Low Loader with a D6".

   Road Superintendent "How can I improve the road without the bulldozer ?".

c) All P.W.D. trucks are needing repair !

   Workshop Manager "The state of the roads is ruining the vehicles".

   D.P.W. "We cannot repair and improve roads quickly without vehicles".

These vicious circles are broken now, the Divisional Engineers have a vested interest in good road maintenance.

. No one else is going to do it for them.

. No one else is going to order them to "fix that pothole now".

. They are responsible for their own division, they cannot "pass the buck".

. Dedication, pride, self reliance, independance Co-operation development, advancement, efficiency - Not Centralisation.

14. Page 22 - 23

The chart and tables are inaccurate as explained earlier, it is not understook why "Mechanical Superintendents" appear on the chart when Senior road Superintendents or Engineering Assistant is omitted.

15. Page 24 - 25

The corrected "figures would be better estimated at
30% of Civil Engineering Personal Emoluments,
20% of Mechanical Branch Personal Emoluments,
5% - 10% of "other charges".

With vacancies for the financial year the Personal Emolument Vote is not fully expended. The Minimum wage, which was static for some time, increased by 100% during 1976. No allowance is made for inflation. Unfortunately, there are a number of errors in the equipment fleet, it was thought that some could have been typing errors but the figures are repeated in later tables. Did no one think of questioning the figure 20 Asphalt Distributors ? (see also tables on page 56 and 101). There is also a language problem - "Dumper" (motorised open skip) has become "Dump truck" ("Tipper in The Gambia) ; "Steel tyred roller" comes out as "Tandem roller". The numbers may be on the high side due to recording all items of that type ever registered in the plant register. There is also some misleading information e.g. the only "Generators" which are in existence are Standby installations at the airfield and hospital they are maintained by the plant section but are on the "liability" side rather than the "asset" side of the balance sheet.

16. Page 26

A further 141 vehicles have been registered since the list was made up.

17. Page 27

While being very desirous to improve the mechanical branch records inventories, and accounts it is a lie to state "without record keeping" records ARE kept and the impression that a "hand to mouth" existence is being followed is untrue, this is deeply resented by everyone involved.

In reading paragraph 3 and paragraph 4 (top of page 28) one MUST wonder what the 3 Senior Mechanical Engineers (all expatriates) are supposed to be doing. It is very difficult to understand the remarks on "Chief Storekeeper" since the Gentleman with this title is not a member of the mechanical branch, nor even a member of the department ! The remaining remarks of paragraph 3 are repeated inaccuracies. It does not really matter whether engineers are nationals or expatriates, BUT, surely, surely, surely, if any consultant were carrying out a study on highway maintenance, the most important people to see and interview would be the HIGHWAY ENGINEERS and the SENIOR MECHANICAL ENGINEERS ? Probably also the Materials Engineer would be able to assist in the investigation and the diagnosis ; these would be the people to give information on inventories, record keeping, organisation, costs, traffic, spares procurement, road condition, detailed instructions etc. The report indicates the existence of these personnel repeatedly and because it does not report otherwise it could be assumed that they have been available over the past number of years. It is certain that the consultants did not interview these men simply because they did not exist - When the study was being carried out the posts of 1 divisional engineer, 2 highway engineers, 1 Material engineer, 1 Project engineer, 1 executive engineer, and 3 senior mechanical engineer were all VACANT, some of the post have now been filled with nationales (new graduates) or expatriates as indicated on the organisation charts, vacancies have been reduced from14 to 8, but will rise again to 10 in the next 2 months ; unfortunately included in the 8 vacancies are the key men for road maintenance 2 Senior Mechanical engineers, the highway engineers and the materials engineer. The consultants gross omission on this very vital point is completely in excusable and makes the report worthless.

18. Page 28 - 19 - 30

The remark "were still being filled by expatriates" gives the impression that the posts were continuously occupied. The true facts are that most of these post were vacant for the past 12 years. The footnotes at the bottom of the tables would imply that interviews were carried out with the key personnel.

19. Page 31

There are several interpretive or language misrepresentations on this page. The Gambia does not use the term "Cantonnage" Routine and periodic maintenance is carried out, periodic maintenance being re-sealing and re-gravelling. Rutting is usually applied to longitudinal irregularities in the direction of vehicle travel the term used for transverse irregularities is "Corrugations", this is what happens. The total number of crews (gangs) their locations and gang strength can be determined on any day from the divisional engineers by 3 telephone calls in about 30 minutes, also equipment disposition and state. Some records are kept, in fact fairly good ideas on quantities involved could be obtained if one had the man hours available to extract this information. It is not considered that plate compactors is a sensible method of compacting dry laterite gravel on a highway.

20. Page 32

There is one sure, quick and easy method of checking whether roads are being maintained - TRAVEL ON THEM, a probability could then become a definite statement with authoritative advice. The draft report is not very clear on the projects to be carried out in the present 5 year plan who recommended them and which are financed e.g. Bituminisation of the Kerewan - Lamin Koto road is not planned for implementation in the present plan. The remainder of the page is further repitition.

21. Page 34

The maintenance frequencies given would indicate that better attention be paid to prevention maintenance - for good maintenance of a paved road with 400 + ADT, it is recommended that there are 10 temporary, 1 permanent patching operations and 6 traffic signals operations per year ; for a gravel road with 200 + ADT, the report recommends 60 anti-corrugations and 5 heavy re-shaping operations,all this activity would certainly reduce the capacity of the highways concerned, in fact for the highly trafficked (200 + ADT) gravel road there would be on the carriageway each year :

24 patching operations,
2 Machining of ditches (both sides 4 operations),
60 Anti-corrugations,
5 Heavy re-shaping,
91 Operations,

plus replenishing (re-gravelling) every 3 years. Omitting the days when the above work could not or would not be done i.e. during the rainy season, public holidays, Sundays etc., there would be men and machines working on every kilometer of these roads about every second day. Design traffic with a lower degree of routine maintenance appears to be a more efficient policy.

22. Page 38

The Draft Report seems to allocate a most peculiar role to Gambia's Public Works Department, it seems to have been relegated into a group of "pot hole menders". The programme of road improvement, re-construction, upgrading (re-habilitation if that word is applicable) IS the P.W.D. programme. It is P.W.D. which liases with funding agencies, consultants, contractors, tender Boards Survey teams, suppliers etc. P.W.D. is the highways arm of Gambia Government and the often repeated remarks on this subject in the report appear rather foolish. The pages on costs are mere repetition (padding).

23. Pages 41, 42, 43

Adjustments should now be made to the forecast changes for 1982, it is unlikely that the Kerewan - Lamin Koto road will be paved by this date. Comments have already been made on personnel and equipment.

24. Pages 44 - 51

At least the report says "it was difficult" and "the short time of the study" in this section and not "It is impossible" - A lot of marks for effort.

25. Chapter 3 - 6

The Consultants sound aggrieved and disappointed that the Gambian road system has not fallen into a state of complete disrepair and is reasonably trafficable. It would appear that his job would have been made a lot easier if the roads were in disastrously shocking condition and full records were available in a form which he could immediately use. Originally it was thought that the repetition of this phrase was due to a language problem but on discussion within P.W.D. it does not appear that this could be possible - the terms used by the senior staff in P.W.D. are unmistakable to anyone with a small knowledge of the English

language - upgrading, improvement, re-construction, backlog maintenance are all reasonably explicit, our terms gravelling, sealing (for paving) bitumenising realignment etc. are more specific. To the anglophone Gambia the americanism "rehabilitation" means a great deal less input than improvement, upgrading or re-construction. The error on the part of the Draft Final Report is inexcusable.

26. Page 55 (Chapter 8)

The "Old" organisation of P.W.D. was centralised in Banjul and the whole nation tended to be the classical "Todpole State" (Just look at the map). The department was, at that time divided into three functional departments with all instructions and orders emanating from Banjul on three different lines of communication and little contact in the field. The Gambia cannot be compared to the other Sahelian States, the problems are different, it is the only anglophone country and for road maintenance operations national "in service" training would appear more reasonable. There is a need to train and re-train Gambian National Staff at all levels including management to replace expatriates. The statement "drivers and equipment operators are overstaffed" needs some explanation - the tables show 460 plant and vehicle items and 280 drivers and operators. The tables and figures are a basis for discussion and adjustment, some of the plant needs, i.e. the composition of the fleet requires explantation - 5 compressors increasing to 7 against 4 graders seems to be an imbalance.

27. Chapter 9

All the points in this chapter seem to have been made previously in the report. They appear to be statement of constraints rather than analysis.

28. Chapter 10

This could be a basis for discussion, adjustments may be necessary.

29. Annex

Some of the figures in tables 3.8.3/2 and 3 appeared to have "slipped" into the incorrect columns and there is some confusion on "days", "man days" or "machine days",they probably can be rectified.

30. Conclusions

It is regrettable that the report has so many points that are inexact, a picture has been painted which gives an impression which is far from accurate. Surely it is significant that The Gambia is listed among the "least developed nations", that there is no hard rock or stone in the country, that water is not universally freely available, that the country is very short on technical skills, that its small size precludes industrialisation on a large scale with small mechanical assets, spares holding etc., that a great deal of materials for roads must be imported (cement, fuel, bitumen, timber, steel). A comment on the consultants opinion of existing road maintenance results is very significantly absent, the P.W.D. is hardly the body to qualify its own efforts. Can the present organisation and methods be improved on or must they all be scrapped ? And if the latter why ? Are the roads in the system :

a) Trafficable all the time in comfort ?
b) Seasonably trafficable only ?
d) Seasonably trafficable with difficulty ?
e) Not trafficable ?

Is the present and past maintenance effort been :

i) Hopelessly bad and a waste of effort ?
ii) Wasteful of facilities available ?
iii) Reasonable for the facilities available ?
iv) Good when considering the constraints ?
v) A very good effort considering the problem and constraints ?
vi) Good or reasonable in the circumstances but inadequate to preserve the asset with the growth of traffic ?

The Draft Report does not appear to have made out a case why any donor or funding agency should contribute to a programme of road maintenance in The Gambia and the data for this is all there :

A small country,
A poor but very industrious people,
Stable Government,
Shortage of basic natural materials,
Shortage of technical skills,
Good absorption of technical training when available,
Careful husbandry of assets (30 year old machines),
A cheaply constructed road system maintained in operative condition in spite of constraints,
Government operating from a 1942 vintage ex Seaplane base of World War II.

Some of the above points would have filled out the report without recourse to the number of repeated paragraphs and tables, and any funding agency would like to know whether its assistance would be properly utilised irrespective of the economic analysis ; if some indication is not given on these points it would be assumed that the diagnosis is negative on these vital matters.