

AFRICAN DEVELOPMENT FUND



PROJECT COMPLETION REPORT

Trans-Kalahari Highway Project **(Gobabis-Buitepos Road Section)**

Government of the Republic of Namibia

January 1999

Infrastructure and Industry Division
Country Department, South

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This report was prepared by Messrs. K.S.H.Rao, Transport Economist (ext.4379) and S.B.Turay, Transport Engineer (ext.5979), OCDS.4 following their mission to Namibia from 21st November – 4th December 1998.

The Division Manager is Mr. G.Giorgis, OCDS.4 (ext.4121).

CURRENCY EQUIVALENTS

1UA	=	3.74638 Rand	3 rd Quarter 1991 (Appraisal)
1UA	=	5.23393 Rand	4 th Quarter 1995 (Last Disbursement)

WEIGHTS AND MEASURES

1 metric ton (t)	=	2,205 lbs
1 kilogram (kg)	=	2.205 lbs
1 metre (m)	=	3.281 ft
1 foot (ft)	=	0.305 m
1 kilometre (km)	=	0.621 mile
1 mile	=	1.609 km
1 square km (km ²)	=	0.386 square mile
1 hectare (ha)	=	0.01 km ²

FINANCIAL YEAR : 1st April – 31st March

ABBREVIATIONS

ADB	=	African Development Bank
ADF	=	African Development Fund
ADT	=	Average Daily Traffic
COMESA	=	Common Market for Eastern & Southern Africa
DCA	=	Directorate of Civil Aviation
DCF	=	Discounted Cash Flow
DMA	=	Directorate of Maritime Affairs
DOT	=	Department of Transport
DTIMC	=	Directorate of Transport Infra. Maintenance & Construction
DTPP	=	Directorate of Transport Policy and Planning
EA	=	Executing Agency
EIRR	=	Economic Internal Rate of Return
GDP	=	Gross Domestic Product
GON	=	Government of Namibia
HDM	=	Highway Design and Maintenance Model
HGV	=	Heavy Goods Vehicle
ICB	=	International Competitive Bidding
LGV	=	Light Goods Vehicle
MOF	=	Ministry of Finance
MWTC	=	Ministry of Works, Transport and Communication
NAC	=	Namibia Airports Company
NRA	=	Namibia Roads Authority
NRC	=	Namibia Roads Contractor
NRFA	=	Namibia Road Fund Administration
PCR	=	Project Completion Report
PIA	=	Project Influence Area
PMS	=	Pavement Management Section
PSI	=	Pavement Serviceability Index
RF	=	Road Fund
SADC	=	Southern African Development Community
SIDA	=	Swedish International Development Authority
SOOE	=	State Owned Operational Entities
TKH	=	Trans-Kalahari Highway
UA	=	Unit of Account
VOC	=	Vehicle Operating Cost
VPD	=	Vehicles per Day

Namibia
Project Completion Report – Trans-Kalahari Highway Project

Executive Summary

1. The main objective of the Trans-Kalahari Highway (TKH) Project was to upgrade the existing gravel road between Gobabis and Buitepos to bitumen standard with a view to providing a safe, faster and all-weather road linking Namibia with Botswana. The project was jointly financed by the African Development Fund (ADF) and the Government of Namibia (GON). The project consisted of: a) civil works for upgrading the existing two lane gravel surface road to bitumen standard with 7.4 metre wide carriageway and 2.50 metre shoulders on each side including drainage structures and ancillary works; and b) consultancy services for the supervision of related works.
2. The TKH project was to be financed by ADF as a typical road construction project comprising civil works and supervision. But during the appraisal mission it became clear that the GON had budget allocation for construction and supervision and the Bank finances were required for procuring new construction equipment for replacing old ones. Though, this, in effect, changed the orientation of the Bank financed project components, in view of the project's regional significance and the Bank Group's eagerness to participate in the financing of the first project, the Bank management favourably considered the project and went ahead with appraisal. The economic viability of the project was, however, assessed as for a typical road construction project. This approach posed major limitation as it did not capture the benefits traceable to investment on construction equipment.
3. The substantial completion for the project was achieved in June 1996, about 18 months behind the appraisal schedule. All environmental protection measures were undertaken during the implementation of the project. The delay had occurred mainly during construction period and was attributable to: i) labour problems associated with force account construction, ii) lack of adequate number of skilled and experienced supervisors, iii) frequent breakdown of construction machinery in the earlier stages of construction and iv) delays in the procurement of new machinery.
4. The actual cost of the project as a whole (UA 18.34 million) was less than the appraisal estimate (UA 21.07 million). There was, however, an acceptable cost overrun of 16.35% in the case of civil works (including supervision) financed by the GON. This was mainly due to the delay in the completion of civil works. The actual cost procurement of equipment funded by the ADF was only UA 3.47 million i.e. about 42% of the appraisal estimate of UA 8.29 million. The significantly low expenditure on equipment was due to the fact that additional equipment was made available to the project from other sources. Hence, the ADF loan of UA 8.29 million was not fully disbursed and the loan balance of UA 4.82 million was cancelled on 14-04-99.

5. The project was supervised in-house by the Department of Transport (DOT) and the civil works were carried out on force account. All the construction equipment under the ADF loan was procured through International Competitive Bidding (ICB) following the Bank rules of procurement. Submission of monthly and quarterly progress reports was regular.
6. The procurement of less equipment under ADF loan was found to be appropriate as the remaining equipment was made available from other sources at no additional cost. Taking into account factors such as time and cost, compliance with contract conditions, adequacy of supervision and reporting, the overall project performance has been assessed as satisfactory on a rating scale ranging from highly satisfactory to highly unsatisfactory. The performances of the borrower, executing agency, contractor/supplier and the Bank have been rated satisfactory.
7. Though the TKH road section was well designed in terms of geometric characteristics and its present condition is very good, the actual traffic materialisation was, however, lower compared to the appraisal expectations. The low traffic levels are mainly due to inconsistent transit charges and traffic safety problems on the TKH section on the Botswana side.
8. Taking into account the actual project costs and revised project benefits in line with the updated traffic forecasts, the economic internal rate of return (EIRR) for the project has been recalculated as 24%.
9. Lessons learnt from the project execution are as under:
 - While the TKH project as a whole was well conceived and designed, the Bank financed component was not well thought out. To avoid similar situation in future Bank funded projects, the Bank financed project components should be so formulated as to enable identification and quantification of related benefits and assessment of economic viability.
 - In the case of projects with regional implications, there is a need for co-ordination between the concerned countries not only at the project formulation and implementation stages but also during operation phase. This would facilitate full achievement of project objectives.

BASIC PROJECT DATA

- | | | | |
|----|------------------|---|--|
| 1. | Country | : | Namibia |
| 2. | Project | : | Trans-Kalahari Highway Project |
| 3. | Loan number | : | F/NAM/ROD/92/1 |
| 4. | Borrower | : | Government of Namibia |
| 5. | Beneficiary | : | Government of Namibia |
| 6. | Executing Agency | : | Department of Transport, Ministry of Works,
Transport and Communication |

A.	<u>Loan details</u>		<u>Appraisal</u>	<u>Actual</u>
1.	ADF Loan (UA million)	:	8.29	3.47
2.	Interest Rate	:	Nil	Nil
3.	Service Charge	:	0.75%	0.75%
4.	Repayment Period	:	40 years	40 years
5.	Grace Period	:	10 years	10 years
6.	Loan Negotiation Date	:	November 1991	April 1992
7.	Loan Approval Date	:	December 1991	May 1992
8.	Loan Signature Date	:	June 1992	30-09-1992
9.	Date of Entry into Force	:	September 1992	26-01-1993

B. Project Data

1. Project Cost

Item of Cost	UA in million	
	As per Appraisal Estimate	Actual
Foreign Exchange Component	18.22	3.47
Local Cost Component	2.85	14.87
Total Cost	21.07	18.34

2. Source of Finance

Source of Finance	UA in million							
	As per Appraisal Estimate				Actual			
	F.E.	L.C.	Total	%	F.E.	L.C.	Total	%
ADF	8.29	-	8.29	31	3.47	-	3.47	19
GOL	9.93	2.85	12.78	69	-	14.87	14.87	81
Total	18.22	2.85	21.07	100	3.47	14.87	18.34	100

			<u>Appraisal</u>	<u>Actual</u>
3.	Effective Date of First Disbursement	:	NA	05-04-1993
4.	Effective date of Last Disbursement	:	31-12-1995	05-10-1995
5.	Commencement of Project	:	March 1992	March 1992
6.	Completion of Project	:	Dec. 1994	June 1996

C. Performance Indicators:

1. Cost Overrun : Nil
2. Time Overrun : 18 months
- Slippage on Effectiveness (%) : 33 %
 - Slippage on Completion Date (%) : 54%
 - Slippage on Last Disbursement (%) : 0%
 - Number of Extensions of Loan Validity Period : none
3. Project Implementation Status : Completed
4. List of Verifiable Indicators and Levels of Achievement

Evaluation Criterion	Score	
	Maximum	Actual
1. Time Overrun	4	2
2. Cost Overrun	4	2
3. Adherence to Contractual Conditions	4	3
4. Adequacy of Supervision and Reports	4	3
5. Operational Performance	4	4
Total Score	20	14

5. Implementation Performance

- Institutional Performance : Satisfactory
- Supplier's Performance : Satisfactory

6. Economic Internal Rate of Return (EIRR)

- Appraisal : 38 %
- Actual : 24 %

D. Missions

Type	Number of Persons	Composition	Man-days
1. Identification	4	Director, Division Chief, Economists and Engineers	56
2. Preparation	n/a	n/a	n/a
3. Appraisal	2	Tpt. Economist and Civil Engineer	28
4. Follow up/Launching	1	Loans Officer	15
5. Supervision (3)	1	Transport Engineer	42
6. PCR/Supervision	2	Tpt. Economist and Tpt. Engineer	30

E. ADF Loan – Bank Disbursements (UA Million)

Item/Year	Appraisal Estimate	Actual	%
1991	1.89	0.0	0.0
1992	3.61	0.0	0.0
1993	1.57	1.46	93.0
1994	1.22	1.73	142.0
1995		0.28	-
Total Disbursed	8.29	3.47	41.8
Undisbursed Balance		4.82	
Loan Savings		4.82	

F. Contractor/Supplier

Details of Equipment Suppliers and Contracts							
Lot #	Name of the Contractor/Supplier	Equipment for Supply		Date of Contract	Date of Delivery		Delay in weeks
		Description	#		Contract	Actual	
1.	Namibian Eng. Corp.	Crawler Tractor	1	25/10/94	20/3/95	19/5/95	8
2.	VME International	Water Tankers	6	10/2/94	19/5/94	20/9/94	16
3.	SAAB Scania AB	Bitumen Distributor Truck	1	10/2/94	7/7/94	16/6/94	-4
4.	Ingersoll-Rand Namibia	Tyre Roller	1	11/2/94	10/6/94	10/10/94	16
5.	Ingersoll-Rand Namibia	Tandem Roller	1	11/1/94	20/5/94	29/4/94	-1
6.	Ingersoll-Rand Namibia	Tandem Vibratory Roller	1	11/2/94	10/6/94	2/6/94	0
7.	Ingersoll-Rand Namibia	Single Drum Vibratory Roller	2	11/2/94	10/6/94	29/4/94	-2
8.	Mindeco (Pty) Ltd.	Hand operated Vibratory Roller	2	9/2/94	10/6/94	29/6/94	4
9.	Pedaco Engineering	Tractor with Auger Drill	1	9/2/94	13/7/94	27/7/94	2
10.	Windhoecker Maschinenfabrik (Pty) Ltd	Single Axle Dolly & 4-Axle Semi-trailer	1	16/9/94	23/12/94	13/4/95	16
11.	Pedaco Engineering	Tructor Tractor	1	9/2/94	3/8/94	24/8/84	4
12.	Merubeni Corporation	Platform Truck (12 Ton)	1	10/2/94	15/3/94	25/3/96	0
13.	Inter Supply	Quick Coupling Steel Pipes (6 metre length each)	8500	14/2/94	9/5/94	27/7/94	4

Namibia: Trans-Kalahari Highway Project - Retrospective MPDE Matrix

PCR Team: K.S.H. Rao / S.B.Turay, OCDS.4

Narrative Summary (NS)	Verifiable Indicators (VI)	Means of Verification (MOV)	Important Assumptions																																																																				
<p>Goal:</p> <p>1. To ensure a) maintenance of existing road infrastructure to avoid deterioration; b) development of roads in previously neglected areas; and c) upgrading of road links to neighbouring countries.</p>	<p>1.1 Increase in the total length of well-maintained/ rehabilitated/ bituminized rural roads in the country.</p> <p>1.2 Overall growth in traffic.</p> <p>1.3 Improved socio-economic welfare in the project area and regional integration including enhanced international trade.</p>	<p>1.1 Annual road maintenance/ construction statistics from Department of Roads, MWTC.</p> <p>1.2 Annual traffic data.</p> <p>1.3 National Income Statistics</p>	<p>(Goal to Supergoal)</p> <p>1.1 Adequate Government Commitment.</p>																																																																				
<p>Project Objective:</p> <p>1. To improve transport service levels and road safety conditions on the Trans-Kalahari Highway (TKH) connecting Namibia and Botswana.</p>	<p>1.1 Reduction in VOC when the road was open to traffic in 1996.</p> <p>1.2 Growth in traffic</p> <p>1.3 Maintenance Budgets.</p>	<p>1.1 Updated EIRR indicates a rate of. 24%.</p> <p>1.2 Traffic: ADT in 1998 was about 50% of appraisal estimate</p> <p>1.3 Traffic Accident Statistics</p>	<p>(Project Objective to Goal)</p> <p>1.1 Ability of GON to provide adequate financial resources for carrying out maintenance works effectively.</p> <p>1.2 Availability of technical and managerial staff.</p>																																																																				
<p>Outputs:</p> <p>1. Completely constructed 75 km bitumen road of 7.4 m carriageway width and two 2.5 m surfaced shoulders between Gobabis and Buitepos.</p>	<p>1.1 Actual length of completed road.</p>	<p>1.1 Progress Reports from the Borrower and ADB supervision missions.</p> <p>1.2 Project Final Completion Report</p> <p>1.3 Project Completion Reports (PCR).</p>	<p>(Output to Project Objective)</p> <p>1.1 Project completed with time over run (18 months) resulting in an acceptable cost overrun (16.35%) in civil works component. Budget for the project and maintenance provided.</p>																																																																				
<p>Activities/Components:</p> <p>1.1 Procurement of construction equipment.</p> <p>1.2 In-house supervision and actual construction of bitumen road through 'Force Account'.</p>	<p>Inputs/ Resources: As per Appraisal Cost Estimates (UA million)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Category</th> <th style="text-align: right;">F.E</th> <th style="text-align: right;">L.C.</th> <th style="text-align: right;">Total</th> </tr> </thead> <tbody> <tr> <td>Works</td> <td style="text-align: right;">13.82</td> <td style="text-align: right;">1.79</td> <td style="text-align: right;">15.61</td> </tr> <tr> <td>Supervision</td> <td style="text-align: right;">0.80</td> <td style="text-align: right;">0.54</td> <td style="text-align: right;">1.34</td> </tr> <tr> <td>Contingency</td> <td style="text-align: right;">3.60</td> <td style="text-align: right;">0.52</td> <td style="text-align: right;">4.12</td> </tr> <tr> <td>Total</td> <td style="text-align: right;">18.22</td> <td style="text-align: right;">2.85</td> <td style="text-align: right;">21.07</td> </tr> </tbody> </table> <p>Financing Plan As per Appraisal Estimates (UA million)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Source</th> <th style="text-align: right;">F.E.</th> <th style="text-align: right;">L.C.</th> <th style="text-align: right;">Total</th> </tr> </thead> <tbody> <tr> <td>ADF</td> <td style="text-align: right;">8.29</td> <td style="text-align: right;">-</td> <td style="text-align: right;">8.29</td> </tr> <tr> <td>GON</td> <td style="text-align: right;">9.93</td> <td style="text-align: right;">2.85</td> <td style="text-align: right;">12.78</td> </tr> <tr> <td>Total</td> <td style="text-align: right;">18.22</td> <td style="text-align: right;">2.85</td> <td style="text-align: right;">21.07</td> </tr> </tbody> </table>	Category	F.E	L.C.	Total	Works	13.82	1.79	15.61	Supervision	0.80	0.54	1.34	Contingency	3.60	0.52	4.12	Total	18.22	2.85	21.07	Source	F.E.	L.C.	Total	ADF	8.29	-	8.29	GON	9.93	2.85	12.78	Total	18.22	2.85	21.07	<p>Actual Project Costs (UA million)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Category</th> <th style="text-align: right;">F.E</th> <th style="text-align: right;">L.C.</th> <th style="text-align: right;">Total</th> </tr> </thead> <tbody> <tr> <td>Works</td> <td style="text-align: right;">3.47</td> <td style="text-align: right;">13.35</td> <td style="text-align: right;">16.82</td> </tr> <tr> <td>Supervision</td> <td style="text-align: right;">-</td> <td style="text-align: right;">1.52</td> <td style="text-align: right;">1.52</td> </tr> <tr> <td>Total</td> <td style="text-align: right;">3.47</td> <td style="text-align: right;">14.87</td> <td style="text-align: right;">18.34</td> </tr> </tbody> </table> <p>Actual Financing Plan (UA million)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Source</th> <th style="text-align: right;">F.E.</th> <th style="text-align: right;">L.C.</th> <th style="text-align: right;">Total</th> </tr> </thead> <tbody> <tr> <td>ADF</td> <td style="text-align: right;">3.47</td> <td style="text-align: right;">-</td> <td style="text-align: right;">3.47</td> </tr> <tr> <td>GON</td> <td style="text-align: right;">-</td> <td style="text-align: right;">14.87</td> <td style="text-align: right;">14.87</td> </tr> <tr> <td>Total</td> <td style="text-align: right;">3.47</td> <td style="text-align: right;">14.87</td> <td style="text-align: right;">18.34</td> </tr> </tbody> </table>	Category	F.E	L.C.	Total	Works	3.47	13.35	16.82	Supervision	-	1.52	1.52	Total	3.47	14.87	18.34	Source	F.E.	L.C.	Total	ADF	3.47	-	3.47	GON	-	14.87	14.87	Total	3.47	14.87	18.34	<p>(Activity to Output)</p> <p>As to the ADF loan that was meant for procuring new construction equipment, the project was completed with an unutilised loan balance of UA4.82 million.</p>
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Note: Any inconsistencies in the above matrix may be explained by the fact that the original project design was not based on the MPDE Matrix approach, and the matrix has been formulated in retrospect.

1. INTRODUCTION

1.1 Namibia is a vast and thinly populated country along the south-western part of Africa. The country has a long coastline of about 1,500 km with Atlantic Ocean. It is bounded by Angola in the North, Zambia in the north-east along the Caprivi Strip, Botswana in the East, South Africa in the south-east and Atlantic Ocean in the West. The total area of the country is 825,000 km², of which some 444,000 km² is variably suitable for agricultural activities. In 1995, the country's population was estimated at 1.6 million and is expected to grow at about 3% per annum. The Namib and Kalahari deserts, on the west and east respectively, occupy a significant share of the land area, with Namib alone accounting for about 20% of the country. Namibia is an arid country with low average and highly variable rainfall.

1.2 Namibia is endowed with a variety of important minerals, ranging from world-class deposits of uranium and diamonds to smaller but significant deposits of gold, silver, tin, lead, zinc and copper. Industrial minerals such as granite, marble and salt also exist in relative abundance.

1.3 Given the transport geography of the country characterized by long distances, sparsely populated settlements and uneven distribution of natural resources, the role of transport infrastructure such as road network, airports and railways assumes crucial importance in the efficient movement of goods and passengers. To this end, the transport sector's overall goal as stated in the First National Development Plan (1995/96-1999/2000) is to ensure availability of safe, effective and efficient transport services. The Government of Namibia's (GON) priorities towards achieving these goals are: i) to maintain and rehabilitate the existing road network, ii) to provide roads primarily in the under-developed regions and iii) to improve road links to neighbouring countries.

1.4 Since Namibia became a member of the Bank Group in April 1991, this project is the second Bank Group operation in the country; the first operation being a Technical Assistance Fund (TAF) grant of UA 0.63 million for financing of the study of the resources of the Northern Communal Land areas.

1.5 This project, which links Gobabis with Buitepos, was first identified in 1990 as one of the main road links to be upgraded in a study financed by Swedish International Development Authority (SIDA). The project is a section of the Trans-Kalahari Highway (TKH) and connects the Botswana section at Mamuno and will be of international significance as a transit route for promoting international trade and regional co-operation. In view of the importance attached to this road section, the GON financed the feasibility and detailed engineering studies that were completed in June 1991. A Bank mission that visited Namibia in May 1991 identified the project.

1.6 At the request of the GON, in July 1991, a Bank's mission appraised the project based on the project documents prepared by the consultants and the Ministry of Works, Transport and Communication (MWTC). The TKH project was to be financed by ADF as a typical road construction project comprising civil works and supervision. But during the appraisal mission it became clear that the GON had budget allocation for construction and supervision and the Bank finances were required for procuring new construction equipment for replacing old ones. Though, this, in effect, changed the orientation of the Bank financed project components, in view of the project's regional significance and the Bank Group's eagerness to participate in financing the project, the Bank management favourably considered the project and went ahead with appraisal. The economic viability of the project was, however, assessed as for a typical road construction project. Following the appraisal and the loan negotiations with the GON in April 1992, an African Development Fund (ADF) loan of UA 8.29 million was approved in May 1992. A map showing the project road location is given in Annex 1.

1.7 To facilitate realisation of full benefits of this regional project, the Bank has also financed the TKH section on the Botswana side through a loan of UA 29.09 million (ADB: UA 18.50 million and ADF: UA

10.59 million) that was approved in November 1991. This project was completed and opened to traffic in the first quarter of 1998.

1.8 This Project Completion Report (PCR) is based on the data and information provided in the borrower's PCR and that collected by a mission that visited Namibia in November-December 1998. The sources of information and documents referred are listed in Annex 2.

2. PROJECT OBJECTIVE AND FORMULATION

2.1 Project Objective

The major focus of transport sector policy was, inter alia, to improve road links with the neighbouring countries of Angola, Botswana, Zambia and Zimbabwe. The objective of the present project was to improve transport service levels and road safety conditions on the Trans-Kalahari Highway connecting Namibia and Botswana.

2.2 Project Components and Design

2.2.1 The project as designed and implemented consisted of: **a)** construction works for approximately 75 kilometre (km) bitumen road of 7.4 metre (m) carriageway width and two 2.5 m surfaced shoulders between Gobabis and Buitepos; and **b)** consultancy services for pre-construction services and the supervision of related works.

2.2.2 As planned, the improved road followed the existing alignment up to kilometre post 17.5 where it deviated to the north on a new alignment and finally joined the existing alignment at kilometre post 92.5 near Buitepos; thus representing a new construction of 75 km. The project road has a design speed of 120 kph, a minimum vertical curve radius of 220 m, and a maximum slope of 4.43%.

3. PROJECT EXECUTION

3.1 Effectiveness and Start-up

The project was approved in May 1992 and the loan agreement was signed in September 1992. The loan was declared effective in January 1993 (i.e. 8 months after the loan approval). There were no special conditions precedent to the first disbursement and "other conditions" were required to be fulfilled during project implementation (Annex 3). The main reason for the delay was lack of GON's awareness in the Bank's procedures and formats involved for declaration of loan effectiveness. For instance, the legal opinion that was originally submitted in GON's format had to be resubmitted in the Bank's format. The delay in loan effectiveness did not, however, have any impact on project implementation as the "force account" construction had already started and the earliest delivery of the construction equipment was to commence from November 1993.

3.2 Modifications

The list of construction equipment planned for procurement under the ADF loan was significantly reduced as additional equipment was made available to TKH project from i) surplus equipment from the MWTC's other construction units and ii) equipment (12 graders, 2 dozers and 2 loaders) received from the Government of Japan. A statement of actual procurement of machinery is given in Annex 4. Since the required equipment was in place, this change did not affect the project. The ADF financed categories of expenditure was modified twice to accommodate these changes as brought out in Table 3.1.

Table 3.1 Modifications in ADF Financed Categories of Expenditure

(in UA million)

Category	At Appraisal	As revised in	
		Sept. 1992	June 1993
A. Equipment	5.53	7.77	5.75
B. Equipment Operations	0.89	-	-
C. Construction Materials	0.74	0.48	2.50
D. Unallocated	1.13	0.04	0.04
Total	8.29	8.29	8.29

3.3 Implementation Schedule

3.3.1 The ADF loan that was initially scheduled for approval in December 1991 was actually approved in May 1992. To allow for the delay, the project implementation schedule as at appraisal was revised in August 1992. The appraisal and actual implementation schedules for the project are as under and also depicted in Annex 5.

<u>Activity</u>	<u>Appraisal Timing</u>	<u>Revised</u> (August 1992)	<u>Actual</u> <u>Timing</u>
<u>1. Civil Works</u>			
Works commenced	March 1992	March 1992	March 1992
Works completed	Dec. 1994	Dec. 1994	June 1996
End of Maintenance Period	Dec. 1995	Dec. 1995	June 1997
<u>2. Procurement of Construction Equipment</u>			
Tenders Evaluated	April 1992	May 1993	Feb. 1994
Contract Awarded	July 1992	Aug. 1993	March 1994
Delivery Commenced	Oct. 1992	Nov. 1993	April 1994
Final Delivery	April 1993	May 1994	March 1996
End of warranty period	April 1994	May 1995	March 1997

3.3.2 The delay of 18 months in project implementation was sustained during construction and procurement of equipment. In the early stages, the progress of construction was significantly hampered due to the frequent breakdown of construction machinery that was very old. Though the situation improved with the arrival of new machinery, the delay could not be avoided because of the working conditions and labour problems that characterised the force account method. The major factors were:

- a) Labour problems; especially low turn out even after allowing for normal leave and annual camp closure period,
- b) Lack of adequate number of skilled and experienced supervisors,
- c) Frequent breakdown of construction machinery and scarcity of spare parts, and
- d) Delays in procurement of new construction equipment.

3.3.3 The contribution of the last factor towards delay in project implementation was minimal as all the critical equipment were procured by middle of 1994 (Annex 4).

3.4 Procurement

3.4.1 The Department of Transport (DOT), MWTC supervised construction work in-house and constructed the road on force account. The construction equipment financed under the ADF loan were procured through International Competitive Bidding (ICB) following pre-qualification of suppliers in accordance with the Bank's Rules and Procedures. The contract award process for different components was as discussed below.

3.4.2 The invitation to bid for the procurement of construction equipment was issued on 30-07-1993 and closed on 30-09-1993 in accordance with the ICB mode of procurement. Out of 17 lots for which bids were sought, Lot # 2, 4, 16 and 17 were cancelled as the equipment under these lots were available from the two sources mentioned in para 3.2.1. The details of contracts for procurement including the delivery schedules and actual delivery dates are given in Annex 4.

3.5 Reporting

3.5.1 As required in the general conditions of the Loan Agreement, the GON prepared and submitted quarterly progress reports. Their content in terms of keeping the Bank continually informed of the progress on the project was satisfactory.

3.5.2 The GON has not submitted annual audit reports for this project. As a follow up on the PCR mission's discussions, the GON has initiated preparation of annual audit report for the project.

3.6 Project Costs and Financing Sources

Project Costs

3.6.1 At appraisal, the cost of construction of the project (net of taxes) comprising civil works and construction supervision (including contingencies and price escalation) was estimated at N\$ 47.90 million (UA 12.78 million). Further, the cost of procuring additional construction equipment was worked out as NS\$ 31.06 million (UA 8.29 million). The total estimated cost of the project was therefore NS\$ 78.96 million (UA 21.07 million). Against this estimate, at the time of project completion, the actual cost of civil works including supervision was N\$ 56.60 million (UA 14.87 million) and cost of additional equipment procured was NS\$ 13.21 million (UA 3.47 million) resulting in a total project cost of NS\$ 69.81 million (UA 18.34 million).

3.6.2 In other words, the total project was completed with less than the estimated cost. With regard to the individual components, the following is the situation. The actual cost of the civil works (including supervision) exceeded the appraisal estimate by 16.35%. This may not be considered as unreasonable as it falls within the $\pm 20\%$ limits considered for sensitivity analysis (para 4.5.4) . This cost overrun is mainly due to the delay in the completion of construction works (by about 18 months).

3.6.3 The actual cost of procurement of construction equipment was only UA 3.47 million (i.e. about 42% of the appraisal estimate of UA 8.29 million). The significantly low expenditure on procurement of equipment was due to the fact that additional construction equipment was available to the project from other sources as explained in para 3.2.1. Hence, the ADF loan of UA 8.29 million was not fully disbursed and the loan balance of UA 4.82 million was cancelled on 14-04-99. Table 3.2 gives the project cost estimates as at appraisal versus the actual.

Table 3.2: Summary of Project Costs (Appraisal vs. Actual)
(UA million)

Category	Appraisal Estimate	Actual
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	F.E.	L.C.	Total	F.E.	L.C.	Total
Construction	7.19	1.79	8.38	-	13.35	13.35
Equipment	6.63	-	6.63	3.47	-	3.47
Supervision	0.80	0.54	1.34	-	1.52	1.52
Contingency	3.60	0.52	4.12	-	-	-
Total	18.22	2.85	21.07	3.47	14.87	18.34

Financing Sources

3.6.4 As per the appraisal, the GON was to finance road construction including civil works and supervision; and ADF was to contribute funds for the procurement of additional construction equipment. In other words, of the total estimated project cost at appraisal (UA 21.07 million) the share of GON should be UA 12.78 million (61%) and that of ADF should be UA 8.29 million (39%). In comparison to this, the actual contributions of GON and ADF were UA 14.87 million (81%) and UA 3.47 million (19%), respectively. The difference in the two financing plans was mainly attributable to significantly less use of the ADF loan for the reasons mentioned in para 3.2.1.

3.6.5 The financing plan as contained in the appraisal report was, however, different from the one indicated in para 3.6.4 above. The appraisal financing plan wrongly assumed that the total cost of the project to be UA 12.78 million of which the ADF contribution was UA 8.29 million (65%) and the balance of UA 4.49 million (35%) was from GON. This is in contrast to the actual situation whereby the GON was going to finance all the civil works (including supervision) amounting to NS\$ 47.90 million (UA 12.78 million) and the Fund was to finance the acquisition of construction equipment worth NS\$ 31.06 million (UA 8.29 million). In effect, the total cost of the project works out to be NS\$ 78.96 or equivalently UA 21.07 million (see Table 3.2). The error referred above could have crept in due to the last minute changes in the financing components of the ADF and the Bank Group's eagerness to participate in the financing of the project as it was to be the Bank's first project intervention in Namibia. This anomaly did not have any adverse affect on the project financing and execution. A comparison of actual financing and that anticipated at appraisal is presented in Table 3.3.

Table 3.3: Sources of Finance (Appraisal vs. Actual)
(UA million)

Source	Financing Plan as given in the Appraisal Report				Financing Plan if the estimates in Appraisal Report were considered in proper perspective				Actual			
	F.E.	L.C.	Total	Share (%)	F.E.	L.C.	Total	Share (%)	F.E.	L.C.	Total	Share (%)
ADF	8.29	-	8.29	65	8.29	-	8.29	39	3.47	-	3.47	19
GON	1.65	2.84	4.49	35	9.93	2.85	12.78	61	-	14.87	14.87	81
Total	9.94	2.84	12.78	100	18.22	2.85	21.07	100	3.47	14.87	18.34	100

3.7 Disbursements

The slippage in actual disbursement is broadly in line with the delay in project implementation. The ADF loan amount, as at appraisal, was to be fully disbursed during 1991 – 1994. However, the actual disbursements were effected between 1993 and 1995. A comparison of anticipated and actual disbursements is presented in Table 3.4. Actual disbursements by ADF and GON are given in Annex 6.

Table 3.3: Loan Disbursement Profile

Year	Disbursement (UA million)				
	As at Appraisal		Actual Amount Disbursed	Cum. % of Actual Disbursement to	
	Amount	Cum. %		Net Loan	Loan at Appraisal
1991	1.89	22.80			
1992	3.61	66.34			
1993	1.57	85.28	1.46	42.07	17.61
1994	1.22	100.00	1.73	91.93	38.48
1995			0.28	100.00	41.86
Total	8.29	100.00	3.47	100.00	41.86

3.8 Performance of the DOT and Contractor/Supplier

Civil Works

3.8.1 As mentioned earlier, the Department of Transport (DOT) of MWTC supervised the civil works in-house and constructed the road on force account. Though there was a delay of 18 months in completing the construction, the DOT's performance was highly satisfactory in terms of the quality of the output. The road is as per design specifications and the quality has not been compromised. The roughness measurements taken in January 1998 by the Pavement Management Section (PMS) gave an average Pavement Serviceability Index (PSI) of 3.3, which is well above the generally acceptable PSI value of 3.0 for a road in a good condition.

Procurement of Construction Equipment

3.8.2 All the construction equipment for the TKH financed under the ADF loan was procured in 13 lots under International Competitive Bidding (ICB). These 13 lots were procured from 10 different suppliers/contractors (Annex 4). Of these, 6 lots were supplied as per the delivery schedule, for 3 lots the supply timings were exceeded by less than 20% and for the remaining 4 lots the delays ranged between 60% and 120% of the schedule. More specifically, for Lot # 12 (Single Axle Dolly & 4-Axle Semi-trailer), the actual delivery time was 29 weeks as against the contract schedule of 13 weeks. This was because the contract with the original contractor was terminated due to bankruptcy and fresh contract was awarded to the second lowest bidder after due negotiations. As the equipment under Lot #12 was not critical to the project progress, the delays did not have significant impact on the project implementation. On the whole, the supplier/contractor performance was satisfactory.

3.9 Performance of the Executing Agency

The DOT as the Executing Agency (EA) was responsible for i) ensuring fulfilment of loan conditions by the Government, ii) overseeing the implementation of the project, iii) disbursement of funds for payment of suppliers/contractors, iv) progress reporting to the GON and the Bank, and v) liaison with the Bank on technical issues concerning the project. The performance of the EA in accomplishing the above tasks was satisfactory. This was made possible because the EA assigned a senior engineer as the full-time Resident Engineer for the project. The EA's relationship with the Bank, and suppliers/contractors was good.

4. PROJECT PERFORMANCE

4.1 Overall Assessment

4.1.1 The project objective of upgrading the Gobabis-Buitepos road section of the TKH to bitumen standard was successfully achieved. With this improvement, safer, more comfortable and less costly all-weather route is available between Gobabis and Buitepos. Further, this road connects Namibia and Botswana by the shortest high quality all-weather road thereby fostering regional integration on the one hand and facilitating enhanced regional and international trade on the other.

4.1.2 Taking into consideration such factors as project start-up, implementation time, actual cost, timely compliance with contractual conditions, adequacy and effectiveness of supervision and reporting, the project implementation has been assessed as satisfactory, on a rating scale ranging from highly satisfactory to highly unsatisfactory (Annex 7).

4.2 Operating Performance Results

4.2.1 The road as completed has been able to meet the project objective of providing a safe, faster and all weather bitumen road between Gobabis and Buitepos. With a PSI value of 3.3, the road is in a very good condition (para 3.8.1). The PCR mission inspected the road and found that its riding surface is good and there are no pronounced visible load-associated distresses. The road alignment has generous geometrics providing adequate sight distances thereby minimising the incidence of accidents. The side-drains along the road are adequate and free of silt, thereby greatly assisting in the evacuation of water from the road surface.

4.2.2 The actual traffic level during 1998, as per the DOT's traffic survey, was 157 vehicles per day (vpd) comprising 33 heavy vehicles (21%) and 124 light vehicles (79%). The composition of this traffic broadly coincides with the projections for normal traffic (145 vpd comprising 20.6% heavy vehicles and 79.4% light vehicles) as given in the appraisal report. The actual traffic is about 50% of the total traffic (comprising normal, generated and diverted components) anticipated at appraisal. This situation is not unexpected as most of the diverted traffic, which constituted approximately 50% of the appraisal projections, has not yet switched over to the project road mainly due to two factors. First, the TKH section on Botswana side was open to traffic only in the first quarter of 1998 and it normally takes some time before truck operator/drivers and other road users switch over from their present routes. Secondly, inconsistent transit charges and traffic hazards like animals crossing the road, on the Botswana side have also contributed to this low traffic.

4.2.3 The first aspect will automatically be resolved overtime because of the considerable distance (400 km) and time advantage on the project road. As to the second, the Governments of Namibia and Botswana are seized of the issue and have constituted a Joint Commission to examine and recommend solutions to the problems. With the enforcement of recommendations of the Joint Commission, it is expected that the traffic level would reach the appraisal expectations in about 5 years.

4.3 Management and Organisation Effectiveness

4.3.1 The Ministry of Works, Transport and Communication (MWTC) through the Department of Transport (DOT) was responsible for implementation of the project. There are no significant changes in the organisational structure of the DOT since the appraisal of the TKH project. The DOT is headed by an Under Secretary and consists of four directorates: i) Directorate of Transportation Policy and Planning (DTPP), ii) Directorate of Transportation Infrastructure Maintenance and Construction (DTIMC), iii) Directorate of Civil Aviation (DCA) and iv) Directorate of Maritime Affairs (DMA).

4.3.2 One significant development that has taken place since the appraisal is the initiation of MWTC 2000 Project in 1995 with the purpose of restructuring the MWTC and commercialisation of its non-core functions.

The project has made significant progress. Among others, the restructuring of the DOT includes the following:

- a) establishment of Namibian Road Fund Administration (NRFA) under the Ministry of Finance for managing a Road User Charging System
- b) setting up of autonomous Namibian Roads Authority (NRA) for managing the national road network including contracting and supervision of the work performed by contractors. The funds for NRA will come from road user charges.
- c) Establishment of Namibian Roads Contractor (NRC) for performing, on contract basis, road maintenance work presently carried out by DOT.
- d) Creation of Namibian Airports Company (NAC) for commercially managing selected airports.

4.3.3 Following the restructuring, the role of the MWTC will be limited to that of a policy and regulatory body. While NAC has already started its operations, the necessary bills for the creation of the remaining three state-owned operational entities (SOOE) are with the National Assembly for approval. Currently the process of filling the senior management positions for these organisations is underway and it is expected that these organisations will be in place by October 1999. Once fully operational, these SOOEs would provide the necessary resources and expertise for timely and efficient maintenance of road network on a sustainable basis. The proposed organisation chart is given in Annex 8.

4.4 Staff Recruitment, Training and Development

At the conclusion of the restructuring exercise under MWTC 2000 Project, the restructured MWTC will be left with around 300 people to perform its policy and regulatory functions. The remaining employees will be transferred to the various newly created SOOEs without being worse off in terms of their remuneration or benefits. Since 1997, these employees are undergoing special orientation and skill development training courses that would prepare them to efficiently perform allotted jobs in the commercially oriented SOOEs.

4.5 Economic Performance

Overview

4.5.1 The project road which is a section of the Trans-Kalahari Highway is located in the eastern part of Namibia starting from Gobabis and running towards east up to Buitepos over a distance of 75 km. The immediate project influence area (PIA) comprising the whole of Gobabis district and parts of Hereroland is topographically flat. The project road has international significance and its area of influence extends beyond the PIA. The road links Botswana and Namibia/Walvis Bay and also serves as transit route between Zambia/Zimbabwe and Namibia/Walvis Bay as well as other neighbouring countries. The project has achieved the main objective of providing a safer, less costly and comfortable all-weather bitumen road in the PIA and also serves as the least cost regional/transit route for neighbouring countries.

Appraisal Expectations

4.5.2 The volume and composition of the traffic that is expected to patronise the improved road during its economic life (i.e. 1996 to 2015) formed the basis for its economic justification. The total estimated traffic comprised three distinct streams viz. i) normal traffic, ii) generated traffic and iii) diverted traffic. Based on the traffic count data and analysis, base year traffic for the year 1989 was estimated as 106 vpd consisting of 88 light vehicles and 18 heavy vehicles. Keeping in view the traffic growth in the PIA as well as the overall

economic growth, annual growth rates of 4% for light vehicles and 3% for heavy vehicles were adopted for forecasting normal traffic. Considering the time and cost reductions on account of the project road and their expected impact in inducing new traffic, the generated traffic was assumed at 30% of the normal traffic. In view of the significant savings in travel distance (400 km) and time (4 hrs) for traffic between Namibia and South Africa, 130 vpd were estimated to divert to the project road during the year 1990. Assuming 3% per growth, the diverted traffic was projected to reach 151 vpd by 1996 (expected year of opening of project road) and thereafter assumed to remain constant till the end of the design life of the project. The total traffic comprising the normal, generated and diverted traffic components was projected to increase from 323 vpd in 1996 to 505 vpd by 2015 (final year of design life).

4.5.3 The economic cost of the project comprised the cost of construction, supervision and physical contingencies as well as maintenance cost. All these costs were considered net of taxes and price escalation. The major quantifiable economic benefits for project were lower vehicle operating costs (VOC), avoidance of maintenance cost and salvage value of the initial investment.

4.5.4 The streams of economic costs and benefits spanning over the design life of 20 years were calculated and the Economic Internal Rate of Return (EIRR) worked out using Discounted Cash Flow (DCF) technique. This yielded an EIRR of 38%. At 12% opportunity cost of capital, this EIRR indicates very high economic strength of the project. Sensitivity analyses covering three variants viz. a) 20% increase in investment cost b) 20% decline in project economic benefits and c) considering a) and b) together, indicated EIRR of 33.1%, 29.0% and 25.9% respectively. With these rates, the economic viability of the project was considered as highly satisfactory.

Recalculation of Economic Internal Rate of Return (EIRR)

4.5.5 For recalculation of EIRR, the economic costs of the project at appraisal have been revised in the light of the actual construction costs. The economic benefits have been updated keeping in view the trends in traffic growth since the completion of the project.

4.5.6 Considering the level of actual traffic on the project road, observed traffic growth on similar roads and remedial measures expected to be in place to address various factors contributing to lower levels of traffic materialisation, the appraisal traffic forecasts have been revised. In doing so, the observed traffic has been assumed to constitute normal and generated traffic components and these are expected to grow at the rate of 4% per year in the case of light vehicles and 3% per year in respect of heavy vehicles. The diverted traffic component has been assumed to reach the appraisal expectations in the next 5-year period. The revised traffic would grow from 157 vpd in 1998 to 457 vpd in 2016 (Annex 9).

4.5.7 The actual construction and supervision costs (net of taxes and price escalation) as well as the benefits emanating from the revised traffic forecasts formed the basis for reworking the EIRR. The major quantifiable benefits include savings in VOC, maintenance cost and salvage value. The recalculated EIRR is 24% (Annex 10). With this EIRR the economic viability of the project can be rated as highly satisfactory.

5.0 REGIONAL AND ENVIRONMENTAL IMPACT

5.1 Regional Impact

Apart from the direct economic benefits of the project that have been discussed in the preceding sections of the report, the Gobabis-Buitepos road has positive impact on regional integration. Within Namibia, the road links Buitepos and Walvis Bay port. Regionally, the road connects Namibia and Botswana and provides access to Walvis Bay. Further, the road serves as transit between Zambia/Zimbabwe and Namibia/Walvis Bay as well as transit between Johannesburg and Namibia/Walvis Bay. The TKH would

also enhance the prospect of achieving one of the main aims of Southern African Development Community (SADC) and Common Market for Eastern and Southern Africa (COMESA) i.e. removing the trade barriers and improve economic and social ties among their member countries.

5.2 Environmental Impact

5.2.1 As the construction of the road involved substantial realignment to the existing road, a number of negative environmental impacts were identified. These included: i) possible deforestation of adjacent habitat for road fencing using wooden poles, ii) enhanced localised soil erosion, loss of topsoil and bush encroachment, iii) increased distances to reach the new road for some population settlements close to the old road, and iv) increase in the killing of animals as bitumen surfaces are attractive to many nocturnal animals. Various mitigation measures were identified and special provisions were made during and after construction period to minimise the negative impacts. In fact environmental protection measures were included as part of “Other Conditions” of the loan agreement. All the conditions were fulfilled during project implementation phase.

5.2.2 The PCR mission visited the project area and established that the mitigating measures, as required under “Other Conditions”, had been undertaken during the construction phase to minimise, as far as possible, the negative environmental effects normally associated with road upgrading works. The measures carried out included:

- i. Metal fence poles and droppers were used instead of wooden ones for all new fences
- ii. Adequate number of culverts (1 to 3 per each km) are placed on the road to minimise any possible tendency for water to accumulate next to the road and thereby cause erosion as it gets channelled through culverts
- iii. Topsoil from new excavation was set aside and used at the end of the construction of the road to restore the biological viability of the disturbed area. Excavations were landscaped to avoid steeply sloping sides and abrupt edges all of which facilitate erosion
- iv. The existing gravel road was maintained in a reasonable condition and access roads to the bitumen road were appropriately upgraded
- v. Adequate road signs were erected. Special cattle crossings are, however, not provided as these are not required since i) on most parts of the project road the visibility for the motorist is very high and ii) the metal fencing provided on both sides of the road constrains, to a great extent, frequent road crossings by animals.

6. SUSTAINABILITY

6.1 The output of the project is a good quality bitumen road built as per the design specifications. Annual routine maintenance operations are being undertaken on a regular basis since the road was opened to traffic. The GON attaches high priority to the maintenance needs of the road infrastructure, as can be seen from the following.

6.2 During the last five years, the total expenditure of the DOT was around N\$ 300 million per year. Of this, 78% (N\$ 234 million) is on road construction (N\$ 87 million) and maintenance (N\$ 147 million). The total expenditure on road sub-sector (N\$ 234 million) constituted, on the average, 2.3% of the Gross Domestic Product (GDP) during the period. This ratio is very high (about 10 times) as compared to other Southern African countries. More specifically, the expenditure on road maintenance during 1995 was N\$ 3750 per km of proclaimed roads and compares well with the South African figure of N\$ 5200 per km, if allowance is made for low traffic levels and dry climate of Namibia. Further, Namibia is better placed in terms of revenues from road sub-sector. The total financial requirement for road maintenance constitutes about 73.5% of the revenues. All this points to availability of adequate resources for ensuring the

sustainability of investments on road infrastructure and the condition of the existing roads indicates that the funds are being used for the purpose. As mentioned in para 4.3.3, conclusion of the ongoing reorganisation of the DOT would further improve the situation for timely and efficient maintenance of road network on a sustainable basis.

6.3 The construction equipment procured under the ADF loan performed well without any serious mechanical breakdowns during the construction of the TKH. After completion of the project, these machines were distributed in the maintenance units of DOT all over Namibia, where they are engaged in various road maintenance activities. The general appearance of the equipment is still good and their mechanical availability is more than utilisation.

7. PERFORMANCE OF THE BANK AND THE BORROWER

7.1 Performance of the Bank

7.1.1 Consistent with the overall objectives, the project as a whole was well conceived and designed. Some limitations could, however, be noticed in the Bank funded component. The financing for the procurement of construction equipment should not have been limited to a single project as these could be used in other projects after completion of the TKH. It should have been formulated as a separate project with clearly identifiable benefits. In spite of this limitation, there were no deficiencies in the Bank's performance noted during the project implementation. The project was considered one of the priority regional projects by the Government and was well received by the Bank. The loan for this project was timely and high on the development agenda of the country's requirements.

7.1.2 Since the inception of the project, the executing agency received fairly regular monitoring and supervision visits (at least once a year) from the Bank. These missions were of assistance to both the project and the executing agency and to the Bank in successful implementation of the project. The borrower and executing agency were provided with all the necessary guidance and advice to ensure procurement of goods in the implementation of the project, as per Bank's rules and procedures for procurement. To sum up, the overall performance of the Bank during the implementation of the project can be termed as satisfactory.

7.2 Performance of the Borrower

7.2.1 The GON was represented by the DOT of the Ministry of Works, Transport and Communication (MWTC) as the Executing Agency (EA). The EA was responsible for handling all the technical, management and disbursement relating to the project execution, and also co-ordinated with the Bank on all relevant issues.

7.2.2 The performance of the Borrower and EA was satisfactory in regard to speedy fulfilment of loan conditions. In spite of the good quality road, there were cost overruns in civil works (about 16%) mainly traceable to delays in completion of civil works using force account method. The ongoing reorganisation of DOT is a pointer to the realisation of the constraints of force account method. Once the reorganised structure is in place, the situation is expected to improve significantly. On the whole, the Borrower's performance can be rated as satisfactory.

8. CONCLUSIONS, LESSONS LEARNT AND RECOMMENDATIONS

8.1 Conclusions

8.1.1 Achievement of Objectives: The objective of the project was to improve transport service levels and road safety conditions on the Trans-Kalahari Highway (TKH) connecting Namibia and Botswana. The upgrading of the road has been completed successfully, and it has helped in linking the eastern part of

Namibia with the rest of the country as well as providing a good quality regional road between Namibia and Botswana. Furthermore, the condition of the road has improved and contributed to the reduction in travel time and VOC on the main road network. By linking Namibia with neighbouring countries, the TKH would also enhance the prospect of achieving one of the main aims of Southern African Development Community (SADC) and Common Market for Eastern and Southern Africa (COMESA) i.e. removing the trade barriers and improving economic and social ties among their member countries.

8.1.2 The actual cost of the total project was less than the appraisal estimate. Despite substantially less expenditure under ADF loan resulting from the GON's prudent management of loan funds, the project has experienced marginal cost overruns in the execution of civil works. This is mainly attributable to the delay in completion of the civil works.

8.1.3 The Bank funded component should have been formulated as a stand-alone project covering procurement of construction equipment without relating it to any specific construction project. This would have enabled assessment of benefits directly traceable Bank funding and in turn economic viability of the investment.

8.2 Lessons Learnt

8.2.1 While the TKH project as a whole was well conceived and designed, the Bank funded component was not well thought out. To avoid similar situation in future projects, the Bank financed project components should be so formulated as to enable identification and quantification of related benefits and assessment of economic viability of investment.

8.2.2 In the case of projects with regional implications, there is a need for more effective co-ordination between the concerned countries not only at the project formulation and implementation stages but also during operation phases. This would facilitate in the full achievement of project objectives.

8.3 Recommendations

8.3.1 The Bank should devote more attention to project design at appraisal stage.

8.3.2 The Joint Commission of Namibia and Botswana should expeditiously resolve the problems plaguing the anticipated materialisation of traffic so that the project would achieve its full benefits at the earliest.

NAMIBIA

TRANS-KALAHARI HIGHWAY: PROJECT COMPLETION REPORT

PROJECT LOCATION MAP



This map has been drawn by the African Development Bank Group exclusively for the use of the readers of the report to which it is attached. The names used and the borders shown do not imply on the part of the Bank and its members any judgement concerning the legal status of a territory nor any approval or acceptance of these borders.

Namibia
Trans-Kalahari Highway : Project Completion Report

List of Documents Consulted

1. Appraisal Report – Trans-Kalahari Highway Project (NAM//PTTR/91/01)
2. Minutes of Loan Negotiations
3. Loan Agreement (No. F/NAM/ROD/92/1) dated 30-09-1992 between the Government of the Republic of Namibia and the African Development Bank.
4. Borrower’s Project Completion Report.
5. Department of Transport’s Final Completion Report, June 1996.
6. Monthly and Quarterly Progress Reports for the Project.
7. National Transport Master Plan for Namibia – Final Report (September 1998).
8. National Transport Development Plan (Step 1), Final report (March 1997).
9. Transport Newsletter of TransNamib Transport (Pty) Ltd, Volume 2: September/October 1998.
10. MWTC 2000 News (September 1998 Volume 2 No 8): Internal Newsletter of “The MWTC 2000 Project”.
11. Traffic Count Data (1998), Department of Transport.
12. National Accounts: 1982 – 1997, Central Bureau of Statistics, National planning Commission.
13. Quarterly Bulletin (Volume 6), September 1998, Bank of Namibia.
14. Archives of Financial Data and Correspondences available in the Bank. Disbursement data, Back-to-Office Reports, Internal memoranda, Correspondence exchanged with the Borrower and the Executing Agency, etc.
15. Correspondence Archives and Available Financial and other documents at the Department of Transport of the Ministry of Works, Transport and Communication.

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Loan Conditions

1. There were no special conditions precedent to first disbursement.
- 1.1 The GON fulfilled all the general conditions, though it took about 8 months from the date of loan approval.

2. Other Conditions

The Borrower shall:

- i. Cause the resident Engineer for the works to prepare and submit to the Fund and the Executing Agency, certified statement of the work executed and monthly reports on the progress of the construction works in such form and detail as shall be satisfactory to the Fund.
- ii. Take adequate measures for the protection of the environment and, in particular, ensure that:
 - a) culverts are spaced at appropriate intervals to minimise any possible tendency for water to accumulate next to the road and thereby cause erosion as it gets channelled through culverts;
 - b) topsoil from new excavations be set aside and used at the end of the construction of the road to restore the biological viability of the disturbed area; and excavations are landscaped to avoid steeply sloping sides and abrupt edges all of which facilitate erosion;
 - c) metal fence poles and droppers are used in place of wooden ones;
 - d) the existing gravel road is maintained in a reasonable condition or alternatively access roads to the tarred road are upgraded;
 - e) adequate road signs are erected and special cattle crossings are situated on stretches of road where the motorist visibility will not be high.
- iii. inform the Fund of the recommendations of the study on Appropriate Road Transport Taxation and submit to the Fund a copy of the schedule of implementation for review and comment.
- iv. submit to the Fund copies of the final design report and drawings for review and approval before commencement of construction works.

The Borrower fulfilled all the other conditions during the project implementation.

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List of Construction Equipment Procured Under ADF Loan

Lot #	Name of the Contractor/Supplier	Equipment for Supply		Date of Contract	Date of Delivery		Delay in weeks
		Description	Number		Contract	Actual	
1	Namibian Eng.Cooperation	Crawler Tractor	1	25/10/94	20/3/95	19/5/95	8
2	VME International	Water Tankers	6	10/2/94	19/5/94	20/9/94	16
3	SAAB Scania AB	Bitumen Distributor Truck	1	10/2/94	7/7/94	16/6/94	-4
4	Ingersoll-Rand Namibia	Tyre Roller	1	11/2/94	10/6/94	10/10/94	16
5	Ingersoll-Rand Namibia	Tandem Roller	1	11/1/94	20/5/94	29/4/94	-1
6	Ingersoll-Rand Namibia	Tandem Vibratory Roller	1	11/2/94	10/6/94	2/6/94	0
7	Ingersoll-Rand Namibia	Single Drum Vibratory Roller	2	11/2/94	10/6/94	29/4/94	-2
8	Mindeco (Pty) Ltd.	Hand operated Vibratory Roller	2	9/2/94	10/6/94	29/6/94	4
9	Pedaco Engineering	Tractor with Auger Drill	1	9/2/94	13/7/94	27/7/94	2
10	Windhoeker Maschinenfabrik (Pty) Limited	Single Axle Dolly & 4-Axle Semi-trailer	1	16/9/94	23/12/9	13/4/95	16
11	Pedaco Engineering	Truck Tractor	1	9/2/94	3/8/94	24/8/84	4
12	Merubeni Corporation	Platform Truck (12 Ton)	1	10/2/94	15/3/94	25/3/96	0
13	Inter Supply	Quick Coupling Steel Pipes (6 metre length each)	8500	14/2/94	9/5/94	27/7/94	4

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Project Implementation Schedule: Appraisal Vs Actual

Activity	Year																											
	1991				1992				1993				1994				1995				1996				1997			
	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter				
Loan Approval (As at Appraisal)																												
Loan Approval (Actual)																												
Civil Works (As at Appraisal)																												
i. Construction																												
ii. Maintenance Period																												
Civil Works (Actual)																												
i. Construction																												
ii. Maintenance Period																												
Purchase of Equipment (As at Appraisal)																												
i. Bidding/Contract Award																												
ii. Delivery of Equipment																												
iii. End of Warranty Period																												
Purchase of Equipment (Actual)																												
i. Bidding/Contract Award																												
ii. Delivery of Equipment																												
iii. End of Warranty Period																												

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Details of Annual Disbursements (UA million)

Year	Amount Disbursed		
	ADF	GON	Total
1992		2.68	2.68
1993	1.46	3.05	4.51
1994	1.73	3.03	4.76
1995	0.28	3.36	3.64
1996		2.55	2.55
Total	3.47	14.87	18.34

Source: Ministry of Works, Transport and Communication, Namibia and ADB PCR Mission, November-December 1998.

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Performance Rating Scale and Evaluation Criteria

1. Rating Scale

$X \geq 3$	<i>Highly satisfactory</i>
$2 \leq X < 3$	Satisfactory
$1 \leq X < 2$	Unsatisfactory
$X < 1$	Highly unsatisfactory

Where X is the value assigned to a performance variable.

Classification: Implementation performance is considered *satisfactory* if the average value of $X \geq 2$.

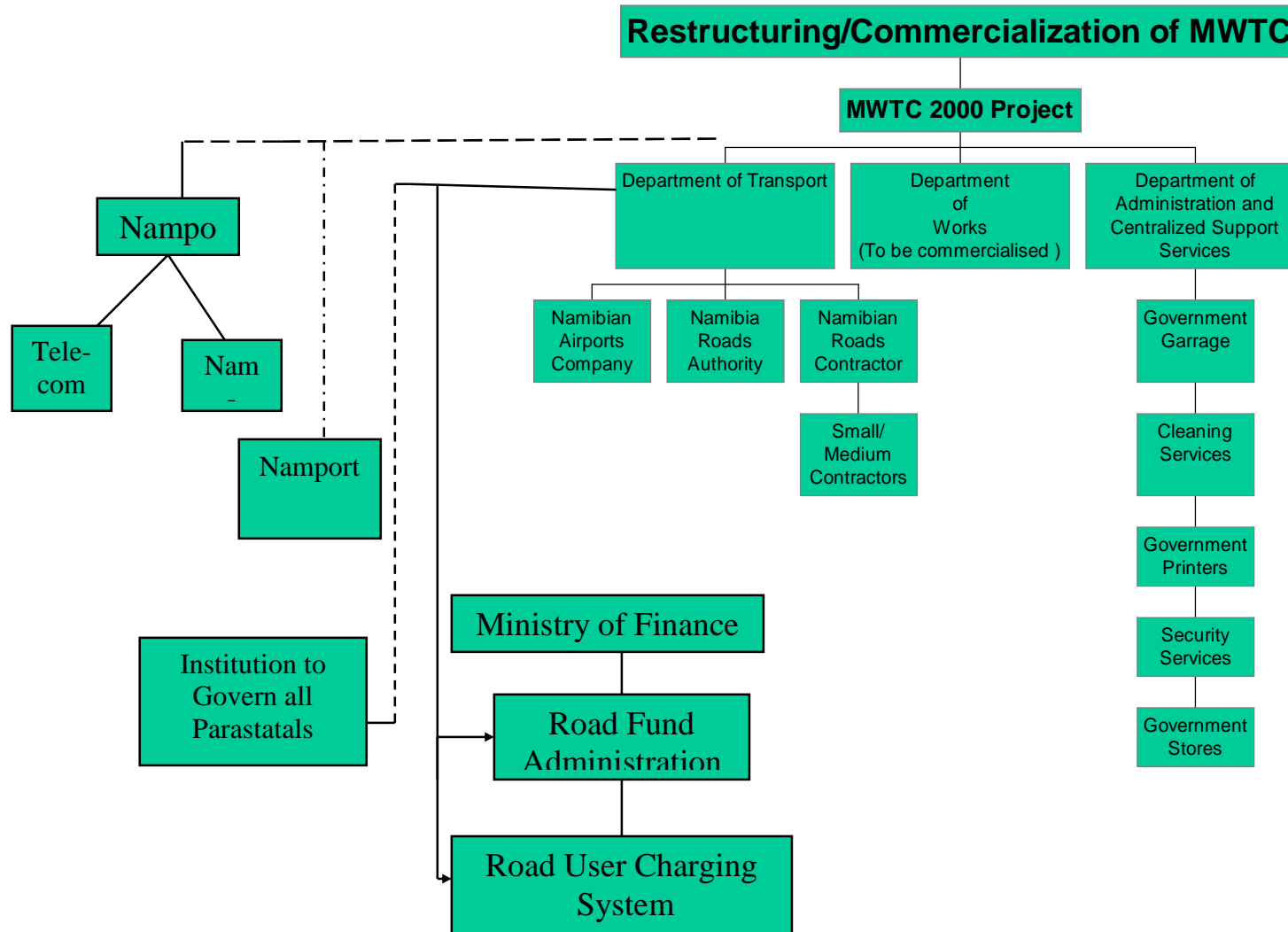
2. Evaluation Results

Performance Indicators	Score	
	Maximum	Actual
1. Time Overrun	4	2
2. Cost Overrun	4	2
3. Adherence to Contractual Conditions	4	3
4. Adequacy of Supervision and Reports	4	3
5. Operational Performance	4	4
Total	20	14

Implementation Performance = $14 \div 5 = 2.7$ (Satisfactory)

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Vehicle Operating Costs (VOC)
(Economic)

Vehicle Class	VOC (N\$/km)- 1991 Price Level		
	Existing Road	Proposed Road	Saving
Car	1.227	0.719	0.508
Combis	2.270	1.020	1.250
LGV	5.273	3.008	2.265
Bus	3.866	2.090	1.776
HGV	10.546	6.016	4.530

Source: Ministry of Works, Transport and Communication, Bank PCR Mission 1998, and Appraisal Report, 1991.

Updated Traffic Forecasts (ADT)

Year	Cars	Combis	LGV	Buses	HGV	Total
1997	104	6	14	2	31	157
1998	104	6	14	2	31	157
1999	128	6	17	3	39	193
2000	152	6	19	4	47	229
2001	177	7	22	5	55	266
2002	202	7	24	6	63	302
2003	227	7	27	7	71	339
2004	232	8	28	7	72	346
2005	237	8	28	7	73	354
2006	242	8	29	8	74	362
2007	248	9	30	8	75	370
2008	254	9	31	8	77	378
2009	260	9	32	8	78	387
2010	267	10	32	8	79	396
2011	273	10	33	8	81	405
2012	280	10	34	8	82	415
2013	287	11	35	8	83	425
2014	295	11	36	8	85	435
2015	303	12	37	8	86	446
2016	311	12	38	8	88	457

Source: Ministry of Works, Transport and Communication, Namibia and ADB PCR Mission November -December 1998.

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Economic Evaluation
(1991 Price Level)

(N\$ million)

Year	Project Cost			Project Benefits				Net Benefits
	Capital Cost	Maintenance Cost	Total Cost	VOC Savings		Maintenance Savings	Total Savings	
				Normal and Generated Traffic	Diverted Traffic			
1992	8.52		8.52				0	-8.52
1993	10.87		10.87				0	-10.87
1994	10.99		10.99				0	-10.99
1995	10.91		10.91				0	-10.91
1996	10.94		10.94				0	-10.94
1997		0.06	0.06	8.19	0.00	0.51	8.70	8.64
1998		0.06	0.06	8.19	0.00	0.51	8.70	8.64
1999		0.06	0.06	8.47	4.72	0.51	13.70	13.64
2000		0.06	0.06	8.76	9.43	0.51	18.70	18.64
2001		0.06	0.06	9.06	14.15	0.51	23.72	23.66
2002		0.06	0.06	9.36	18.87	0.51	28.74	28.68
2003		0.28	0.28	9.68	23.59	0.51	33.78	33.50
2004		0.06	0.06	10.01	23.59	0.51	34.11	34.05
2005		0.06	0.06	10.35	23.59	0.51	34.45	34.39
2006		0.06	0.06	10.70	23.59	0.51	34.80	34.74
2007		0.06	0.06	11.07	23.59	0.51	35.17	35.11
2008		0.06	0.06	11.45	23.59	0.51	35.55	35.49
2009		0.06	0.06	11.84	23.59	0.51	35.94	35.88
2010		0.28	0.28	12.24	23.59	0.51	36.34	36.06
2011		0.06	0.06	12.66	23.59	0.51	36.76	36.70
2012		0.06	0.06	13.09	23.59	0.51	37.19	37.13
2013		0.06	0.06	13.54	23.59	0.51	37.64	37.58
2014		0.06	0.06	14.00	23.59	0.51	38.10	38.04
2015		0.06	0.06	14.48	23.59	0.51	38.58	38.52
2016	-13.06 ⁽²⁾	0.06	-15.77	13.00	23.59	0.51	39.08	52.08
Economic Internal Rate of Return (EIRR)								23.93%

(1) Actual construction cost net of taxes and duties.

(2) Salvage value (25 % of the cost).