

ISN 81581
 CLASSIFICATION
 PROJECT EVALUATION SUMMARY (PES) - PART I

PD-ARY-128

Report Symbol: 11447

1. PROJECT TITLE Agricultural Marketing Development	2. PROJECT NUMBER 660-0028	3. MISSION, AID/W OFFICE KINSHASA
	4. EVALUATION NUMBER (Enter the number maintained by the reporting unit e.g., Country or AID/W Administrative Code, Fiscal Year, Serial No. beginning with No. 1 each FY) 83-11	

5. KEY PROJECT IMPLEMENTATION DATES			6. ESTIMATED PROJECT FUNDING A. Total \$ 8,109,000 B. U.S. \$ 4,000,000	7. PERIOD COVERED BY EVALUATION From (month/yr.) September 1981 To (month/yr.) August 1983
A. First PRO-AG or Equivalent FY 81	B. Final Obligation Expected FY 82	C. Final Input Delivery FY 85		

8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR			B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED
A. List decisions and/or unresolved issues; cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., airgram, SP-1, PIO, which will present detailed request.)				

The attached document summarizes the 14 major recommendations of this joint evaluation of Agricultural Marketing Development Projects 660-0026 and 660-0028. USAID/Zaire concurs in these recommendations and is prepared to take action to implement them at the earliest possible date.

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS			10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT
<input type="checkbox"/> Project Paper	<input checked="" type="checkbox"/> Implementation Plan e.g., CPI Network	<input type="checkbox"/> Other (Specify)	
<input type="checkbox"/> Financial Plan	<input type="checkbox"/> PID/T	<input type="checkbox"/> Other (Specify)	A. <input type="checkbox"/> Continue Project Without Change
<input type="checkbox"/> Logical Framework	<input type="checkbox"/> PIO/C	<input type="checkbox"/> Other (Specify)	B. <input type="checkbox"/> Change Project Design and/or
<input type="checkbox"/> Project Agreement	<input type="checkbox"/> PIO/P		<input checked="" type="checkbox"/> Change Implementation Plan
			C. <input type="checkbox"/> Discontinue Project

11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles)		12. Mission, AID/W Office Director Approval
H.L. Braddock, Capital Projects Officer, USAID/Zaire Roland Moens, Project Manager, Office des Routes Cit. Kimenga Masoka, Director of Training, Office des Routes, Lloyd Crowther, Engineer, John Holtzman, Agricultural Economist, SFMA Project, Phillipe Bossard, Training Specialist		Signature <i>[Signature]</i> John Babylon
AID 1330-15 (3-78)		Date September 28, 1983

PROJECT EVALUATION SUMMARY

This mid-term evaluation constituted, as planned, a joint review of companion Agricultural Marketing Development Projects 660-0026 and 660-0028. It's central conclusions were as follows:

1. Project 660-0026 should return to its original task of bringing the Kasai - Bulungu - Panu and Panu - Mangai - Idiofa roads to the standard of "good earth roads."
2. Project 660-0028 should return to its original task of constructing the Kikwit - Idiofa road to the standard of "prototype road."
3. The present technical assistance team furnished by the prime contractor and its sub-contractor should be replaced in its entirety.
4. Reconstruction work now underway on the Kikwit - Idiofa road should cease immediately, and all AID-financed equipment and technical assistance provided under Project 660-0026 should be relocated to begin work immediately on the Kasai - Bulungu road. A second road improvement crew should be organized, using equipment purchased under 660-0026, and should begin work on this same road no later than January 1984. These two work crews should operate in close proximity to each other throughout the life of the project, should be assisted by only one technical advisor, and should focus their efforts exclusively on the Kasai - Bulungu - Panu and Panu - Mangai - Idiofa roads.
5. USAID should insist that the GOZ honor its agreement to build the Kikwit - Idiofa road to the prototype road standard envisioned in the Project Paper for 660-0028. The road crew formed for this purpose should be self-sufficient and headquartered separately. A professional engineer should be recruited to assume the role of Team Leader during the anticipated three-year construction of this prototype road. This individual must have complete technical and administrative control over the crew's operation to ensure proper construction of the prototype road. A Master Mechanic should also be recruited for work on this prototype road.
6. USAID should insist that all equipment and material purchased for use in Project 660-0026 and not now required for the reduced technical assistance effort on the Kasai - Bulungu - Panu and Panu - Mangai - Idiofa roads be held in reserve for the technical assistance effort to be provided under Project 660-0028.
7. USAID should open discussions with the GOZ about the countrywide problem of earth and granular surfaced road maintenance. The ultimate objective of such discussions should be better maintenance of the project roads than that now provided by the Office des Routes. Without such a solution the benefits derived from these projects will be short-term.

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8. USAID/Zaire should make full use of its in-house engineering capability and the back-up engineering capability available from REDSO/WCA, as well as consulting engineering services as appropriate, rather than relying exclusively on project contracted engineering services, before making further engineering-related decisions pertaining to road construction, bridge construction, and the anticipated port construction.

9. It is clear that the Project Assistance Completion Date (PACD) for Project 660-0028, now September 20, 1985, will have to be extended. USAID and the Office des Routes should be prepared to authorize such an extension once the amount of additional time required is known with a reasonable degree of certainty. It is possible that the PACD for Project 660-0026, now September 13, 1985, will also have to be extended.

10. The evaluation did not identify a need for increased dollar funding of the projects, although it is possible that such a need may emerge as implementation proceeds. USAID/Zaire should remain aware of this possibility and periodically reconsider whether currently available dollar funding is adequate. In contrast, local currency requirements for both projects have increased significantly since preparation of the respective Project Papers, as inflation and devaluation have eroded the purchasing power of the zaire. Local currency requirements will increase still further in the aftermath of the September 1983 devaluation.

11. River transport is of great economic significance in the project area, and is likely to become of still greater importance as project interventions are completed. Therefore USAID should consider taking actions, beyond the port improvements already planned, to improve the efficiency and reliability of river transport (e.g. by working with ONATRA to identify and implement means of reducing losses experienced during storage and shipping).

12. USAID should monitor, on an ongoing basis, various social and economic variables within the project area so as to gain a better understanding of the impact of these and other USAID-assisted projects upon those variables. Data should be gathered on, inter alia., population and migration; land use and agricultural production; child malnutrition; barge and road use; agricultural prices; the supply, distribution, and cost of vehicles, spare parts, and fuel; and on access to credit.

13. USAID should cooperate with Zairian institutions such as the Department of Agriculture's Bureau d'Etudes and/or the Institut National de Statistiques in gathering and analyzing data on the above-mentioned variables.

14. The evaluation found that, if present agricultural practices are followed while more land is put under cultivation, there will be a negative long-run effect upon soil fertility in the project area. USAID should cooperate with the donor community in efforts to prevent such an eventuality. These efforts could include the application of commercial fertilizers and the proper management and utilization of manure supplies from increasing livestock populations.

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SECTION 1: EVALUATION OF THE LIKELY ECONOMIC IMPACTS OF THE
USAID PROJECTS 660-0026 and 660-0028

I. Evolution of the Agricultural Economy of Idiofa and Bulungu Zones and the Likely Impact of 026/028 Road and Port Improvements Upon the Agricultural Economy

- A. Introduction
- B. The Effect of Price Liberalization
- C. Changing Organization of the Agricultural Marketing System
- D. Changing Land Use and Cropping Patterns
- E. The Impact of Road Improvements Upon Rural Household Nutrition
- F. Agricultural Input Supply
- G. The Supply Situation for Vehicles, Spare Parts and Fuel
- H. Volume of River Transport

II. Selection Criteria for Road Improvements

III. Some Observations on Further Monitoring and Evaluation

- A. Introduction -
- B. Activities/Trends Requiring Monitoring
- C. Information that will be Costly to Obtain
- D. Implementation of Monitoring and Evaluation Program

IV. Summary of Recommendations

** The evaluation team decided to assess changes in the agricultural economy since the May 1982 baseline study rather than to evaluate the economic impact of projects 660-0026 and 660-0028 to date. Both projects are in early phases of implementation and project impacts on the regional economy to date are minimal.

I. Evolution of the Agricultural Economy of Idiofa and Bulungu Zones and the Likely Impact of 026/028 Road and Port Improvements Upon the Agricultural Economy

A. Introduction

The agricultural economy of the Idiofa and Bulungu Zones is changing under the stimuli of increasing demand for foodstuffs in the urban areas of Kinshasa and Tshikapa and the liberalization of food crop prices. Production and commercialization of most food crops expanded significantly from 1981 to 1982 (see Tables 1 and 2), while production of palm products has languished during the past decade. More and more forested land is being cleared and put under food crop cultivation, with little concern for the long run consequences to soil fertility of deforestation, uncontrolled burning, and erosion. While household revenues from sales of food crops are increasing, the effect of improved marketing access on rural households' nutrition may not always been positive. Moreover, access to agricultural inputs and consumer goods appears not to have improved in many areas despite the boom in food crop marketing. Finally, the food crop marketing system is undergoing change as the result of large traders and transporters enjoying better access than small and medium sized traders to vehicles, spare parts, fuel and credit. Recent changes in the agricultural economy will be discussed below, as will the likely impact of the 026/028 interventions upon the agricultural production and marketing situation.

B. The Effect of Price Liberalization

Although food crop prices were liberalized on May 29, 1982 in Zaire, 1983 was the first year during which prices were uncontrolled throughout the agricultural buying campaign. - Agricultural commodity prices increased dramatically in the Idiofa and Bulungu Zones from the opening of the buying campaigns in April-May 1983 to the final months of the campaigns in July-August 1983. The farmgate prices per kilogram are shown for selected commodities at three points in time (1982, early 1983, late 1983) in Table 3. Manioc, maize, peanut, upland rice and squash seed prices increased by 50-100% during the 1983 campaign. Part of this increase reflects seasonal price trends, as food crop prices typically rise toward the end of the buying campaign, which coincides with the end of the dry season and seasonal food shortages. The magnitude of price increases during 1983 reflects more than seasonal influences, however. Strong and expanding urban demand in Kinshasa and Tshikapa have put upward pressure on farmgate prices in Kwilu Subregion.

Farmgate prices for fiber (punga) and coffee have not risen as much as prices for other crops. The buying campaign for coffee began only in July 1983 and will not conclude until February 1984, however, so it is too early to judge the magnitude of farmgate price increases. Moreover, coffee prices have increased manyfold since the 1982-1983 campaign, reflecting keen competition for an export crop that generates foreign exchange. By buying coffee and exporting it to foreign markets, firms are able to obtain scarce foreign exchange needed for purchases of vehicles, spare parts, generators and agricultural processing equipment. Since there is a five year lag between coffee planting and actual increases in output, coffee prices will probably continue to rise during the 1983-1984 buying campaign and the next several years before production increases come on line.

TABLE 1 (A)
AGRICULTURAL PRODUCTION DATA FOR IDIOFA ZONE, 1981

COMMODITY	NO. CULTIVATORS	AREA (HA.)	1981 PRODUCTION (METRIC TONS)			YIELD (Kg./ha.)
			TOTAL	MARKETED OUTPUT		
				QUANTITY	%	
Manioc Tubers	169,557	238,182	4,421,357	-	-	18,563
Manioc Cossettes	169,557	238,182	1,041,915	59,488	6%	4,374
Maize	146,032	92,740	122,449	38,713	32%	1,320
Paddy	54,119	12,033	11,624	8,287	71%	966
Peanuts	144,494	47,830	53,093	14,942	28%	1,110
Squash Seeds	96,318	38,445	7,692	1,697	22%	200
Sweet Potatoes	45,526	856	2,578	140	5%	3,012
Yams	40,816	9,020	20,200	147	1%	2,239
Plantains	45,114	991	4,933	94	2%	4,978
Bananas	55,917	1,505	4,517	248	5%	3,001
Voandzou	47,090	6,076	3,048	152	5%	502
Coffee	1,336	2,310	2,246	1,539	69%	972

Source: Annual Report, Agronome du Zone, Idiofa, 1982

TABLE 1 (B)
AGRICULTURAL PRODUCTION DATA FOR IDIOFA ZONE, 1982

COMMODITY	NO. CULTIVATORS	AREA (HA.)	1982 PRODUCTION (METRIC TONS)			YIELD (Kg./ha.)
			TOTAL	MARKETED OUTPUT		
				QUANTITY	TOTAL	
Manioc Tubers	181,626	383,569	6,918,513	-	-	18,037
Manioc Cossettes	181,626	383,569	1,965,196	67,232	3%	5,123
Maize	155,176	103,932	131,144	44,091	34%	1,262
Paddy	59,099	18,947	16,247	5,953	37%	857
Peanuts	162,442	47,900	58,457	16,211	28%	1,220
Squash Seeds	92,973	24,851	12,068	2,651	22%	486
Sweet Potatoes	48,280	1,095	5,422	89	2%	4,952
Yams	53,528	1,760	16,997	225	12%	9,657
Plantain	35,538	564	2,853	1,546	54%	5,059
Bananas	59,812	1,101	3,283	925	28%	2,982
Voandzou	71,345	9,446	4,729	447	9%	501
Coffee	1,537	2,947	2,359	903	38%	800

Source: Annual Report, Agronome du Zone, Idiofa, 1982

TABLE 2 (A)
AGRICULTURAL PRODUCTION DATA FOR BULUNGU ZONE, 1981

COMMODITY	NO. CULTIVATORS	AREA (HA.)	1981 PRODUCTION (METRIC TONS)			YIELD (Kg./ha.)
			TOTAL	MARKETED OUTPUT		
				QUANTITY	TOTAL	
Manioc Tubers	154,065	147,841	2,702,559	-	-	18,280
Manioc Cossettes	154,065	147,841	998,947	266,871	27%	6,757
Maize	94,098	65,014	54,407	16,041	29%	837
Paddy	24,200	8,145	8,941	1,709	19%	1,908
Peanuts	100,371	51,557	41,067	15,770	38%	797
Squash Seeds	95,666	85,436	44,204	5,841	13%	517
Sweet Potatoes	14,327	834	7,201	556	8%	8,634
Yams	15,334	1,063	9,232	917	10%	8,685
Plantain	9,526	1,651	6,111	749	12%	3,701
Bananas	22,147	3,641	13,539	1,016	8%	3,718
Voandzou	16,559	2,748	1,786	253	14%	650
Coffee	6,183	3,867	5,032	1,879	37%	1,301
Palm Fruit	3,507	14,718	54,155	38,313	71%	3,680

Source: Annual Report, Agronome du Zone, Bulungu, 1982

TABLE 2 (B)
AGRICULTURAL PRODUCTION DATA FOR BULUNGU ZONE, 1982

COMMODITY	NO. CULTIVATORS	AREA (HA.)	1982 PRODUCTION (METRIC TONS)			YIELD (Kg./ha.)
			TOTAL	MARKETED OUTPUT		
				QUANTITY	TOTAL	
Manioc Tubers	168,847	161,724	3,099,646	-	-	19,166
Manioc Cossettes	168,847	161,724	1,084,771	343,872	32%	6,708
Maize	127,439	76,050	65,188	24,329	37%	857
Paddy	32,294	11,744	11,786	6,222	53%	1,004
Peanuts	130,203	60,900	47,774	17,049	36%	786
Squash Seeds	116,088	93,535	50,430	13,707	27%	539
Sweet Potatoes	15,172	1,054	9,443	1,200	13%	8,959
Yams	14,379	1,894	12,724	1,907	15%	6,718
Plaintain	35,835	5,642	21,500	11,787	55%	3,811
Bananas	54,412	3,046	22,374	3,604	16%	7,345
Voandzou	18,155	2,401	1,605	596	37%	668
Coffee	17,189	6,049	22,254	17,172	77%	3,679
Palm Fruit	3,259	41,334	72,402	33,612	46%	1,752

Source: Annual Report, Agronome du Zone, Bulungu, 1982

TABLE 3
COMPARATIVE FARMGATE PRICES FOR SELECTED AGRICULTURAL COMMODITIES, 1982-83
(in Zaires/Kg.)

	<u>BULUNGU ZONE</u>			<u>IDIOFA ZONE</u>		
	<u>1982</u>	<u>1983</u>		<u>1982</u>	<u>1983</u>	
		Early in <u>Buying Campaign</u>	Late in <u>Buying Campaign</u>		Early in <u>Buying Campaign</u>	Late in <u>Buying Campaign</u>
Manioc	1.0-1.3	2.0-2.5	3.0-3.3	1.0-1.5	1.0-1.5	2.0-2.5
Maize	0.8-1.1	1.2-1.5	2.0-2.1	0.8-0.9	1.2-1.5	2.0-2.2
Peanuts	1.5-2.1	2.5-3.8	4.5-6.0	1.4-1.5	2.0-3.0	5.0
Paddy	1.3-2.0	2.4-2.5	4.0-5.0	0.7-1.5	2.5	2.5-3.0
Fiber (punga)	-	2.5	3.0	2.2	2.2	2.5
Coffee	2.5	6.0-7.0	8.0-9.0	1.5	5.0-7.5	8.5-10.0
Squash						
Seeds	1.3	4.0-5.5	8.0-10.0		3.0-4.0	6.0

Sources: Interviews with Traders, Missionaries and Agricultural Officers in Bulungu, Idiofa and Kikwit, August 18-26, 1983.

TABLE 4:
RETAIL PRICE INDICES FOR URBAN HOUSEHOLDS IN KIRWIT, FEBRUARY 1982 - MARCH 1983

		General		Other Consumer								Meat &		
		<u>Index</u>	<u>Food</u>	<u>Goods</u>	<u>Cereals</u>	<u>Starch</u>	<u>Legumes</u>	<u>Fruits</u>	<u>Fish</u>	<u>Poultry</u>	<u>Oil</u>	<u>Lodging</u>	<u>Clothing</u>	
February	1982	1509	1619	1319	924	950	1056	948	1306	3204	2021	1523	1515	
March	1982	1523	1511	1544	884	738	1074	1012	1094	2973	1941	2149	1513	
April	1982	1453	1452	1453	947	602	937	1004	1231	2864	1883	1824	1472	
May	1982	1416	1383	1473	813	538	801	884	1673	2862	2016	1817	1452	
June	1982	1518	1526	1505	895	598	1124	1071	1349	3246	1851	1868	1462	
July	1982	1661	1697	1597	882	547	1474	1021	1485	3675	2001	2194	1508	
August	1982	1773	1841	1518	1090	714	997	1429	1500	3950	1640	1361	1490	
September	1982	1611	1620	1599	1180	803	1060	1360	1525	3125	1771	2275	1526	
October	1982	1704	1713	1687	1271	1206	1275	1317	1524	2746	2098	2068	1697	
November	1982	1848	1853	1839	1182	1508	1156	1431	1617	2948	2043	2282	1678	
December	1982	1880	1865	1907	1366	986	1279	1248	1765	3207	2352	2171	1715	
January	1983	2056	2060	2048	1155	1156	1221	1391	1851	3872	2796	2841	1941	
February	1983	2162	2112	2252	1375	1320	1370	1408	1970	3422	2700	3125	2063	
March	1983	2125	2200	1966	1170	1206	1303	949	2005	4375	2975	3143	2106	

Source: Institut National de la Statistique (I.N.S.), Direction Regionale de Bandundu, Prix et Indices des Prix a la Consommation Familiale
Bulletins Mensuels, 1982 and 1983.

NOTE: The indices are calculated using 1976 prices as the base, where 1976 = 100

TABLE 5
RETAIL PRICES OF SELECTED AGRICULTURAL COMMODITIES AT MARKETS IN THE TOWN OF KIKWIT,
FEBRUARY 1982 - AUGUST 1983

	Local		Maize		Manioc		Salted		Beef	
	Rice	Index	Kernels	Index	Cossettès	Index	Fish	Index	Bones	Index
February 1982	6.66	94	2.27	141	2.08	111	46.74	103	26.99	103
March 1982	7.70	108	-	-	2.38	127	36.01	79	33.01	126
April 1982	7.54	106	1.70	106	1.74	93	37.89	83	32.17	123
May 1982	7.10	100	1.61	100	1.87	100	45.56	100	26.12	100
June 1982	7.10	109	1.37	85	2.05	110	52.37	115	36.61	140
July 1982	6.72	95	-	-	1.78	95	55.87	123	30.50	117
August 1982	7.57	107	4.23	263	1.88	100	69.27	152	31.82	122
September 1982	7.17	101	2.55	158	1.70	91	57.81	127	27.73	106
October 1982	7.27	102	2.96	184	2.56	137	58.60	129	31.55	121
November 1982	7.55	106	3.09	192	3.00	160	70.85	156	40.19	154
December 1982	9.51	134	3.08	192	2.29	122	61.83	136	36.94	141
January 1983	9.52	134	-	-	3.46	185	53.33	117	36.01	138
February 1983	9.70	137	2.19	136	3.97	212	62.69	138	37.72	144
March 1983	9.53	134	2.11	131	2.82	151	74.13	163	45.54	174
April 1983	9.68	136	2.01	125	3.85	206	75.16	165	52.50	201
May 1983	12.18	172	2.38	148	3.80	203	51.79	114	51.31	196
June 1983	12.82	181	2.29	142	3.45	184	80.13	176	46.51	148
July 1982	12.87	181	3.38	210	3.38	181	65.71	144	54.38	208
August 1983	14.54	205	4.73	294	3.14	168	-	-	54.48	209

Source: Institut National de la Statistique (I.N.S.), Direction Regionale de Bandundu, Prix et Indices des Prix a la consommation Familiale.

The rapid rise in agricultural prices in the wake of price liberalization will be reinforced by the 026/028 interventions. By improving rural roads and ports on the Kasai River, transport costs will decline for traders based in Idiofa and Bulungu Zones, as well as for those in Kinshasa and Tshikapa. Competition for foodstuffs will increase, putting upward pressure on farmgate prices. Food crop price rises may be tempered by an expansion in food production, provided supply is sufficiently elastic, but increasing urban demand in Kinshasa, Tshikapa and Kananga will in large part offset the price dampening effect of any likely supply expansion.

Increases in consumer goods prices will also lead to higher food crop prices. Producers will continue to demand higher commodity prices as the prices of the soap, salt, sugar, sardines, cloth, footwear and other goods that they buy also rise. Although there is evidence that the terms of trade moved against rural producers in 1982 and early 1983 (see Tables 4, 5), rapid increases in farmgate prices during the 1983 agricultural buying campaign are enabling producers to improve their terms of trade. Some traders report that increasing competition for foodstuffs is allowing producers to dictate prices. Improving the transportation infrastructure should further strengthen producers' bargaining position.

C. Changing Organization of the Agricultural Marketing System

In conducting the baseline survey for project 028 in May 1982, Elizabeth Reid noted that food crop marketing was becoming increasingly fragmented in 1981 and early 1982. Traders based in the collectivities were supplying larger firms in Kikwit and Idiofa with agricultural produce, but they were transporting less and less foodstuffs to Kinshasa in their own vehicles. Although Kinshasa based firms were assembling produce at the farmgate in Idiofa Zone, they were also buying large quantities from wholesalers based in Kikwit and Idiofa. Reid noted fragmentation of agricultural marketing in the project zone, which she attributed to rural traders' limited access to vehicles, spare parts, fuel and credit and to Kinshasa firms' preference to operate on or near the paved road and not to depreciate their vehicles unnecessarily by assembling at the farmgate.

There is evidence that the agricultural marketing system in 1983 is becoming both increasingly fragmented in the project zone and integrated from demand centers. Small and medium sized traders continue to be plagued by poor access to vehicles, spare parts, fuel and credit. In many cases these traders are operating at 25-50% capacity, in that most of their vehicles have depreciated and they have difficulty obtaining spare parts or new trucks. Spare parts and vehicles can be purchased in Kinshasa, but their costs have increased significantly during the past year. Increases in food crop prices have increased working capital requirements for agricultural buying. Smaller firms without sizeable cash reserves are squeezed because they need greater liquidity for crop, fuel and spare parts' purchases. Most of the Zairian traders interviewed in Idiofa and Bulungu Zones reported that they had bought significantly greater tonnages of food crops in 1981 and 1982 than in 1983. Moreover, these traders claim that increased competition from buyers outside Kwilu Subregion has forced them to assemble farther from the towns in 1983 than in the recent past in order to buy produce at attractive prices.

At the same time traders and transporters based in Kinshasa and Kasai Occidental are assembling increasingly at the farmgate in Idiofa and Bulungu Zones. Farmgate assembly by urban traders and transporters is not a new

phenomenon, but it is taking place on a wider scale in 1983 than in previous years. Demand for foodstuffs has expanded steadily in urban areas and wide urban-rural price differentials have provided an attractive incentive for urban based traders to go directly to the farmgate. Some of these traders do not own trucks, but they are able to rent vehicles for transporting foodstuffs from rural areas. Many of the buyers are larger firms in Kinshasa which have better access to vehicles, spare parts, fuel and credit than firms in rural areas. This has enabled them to expand their scale of operations, while firms based in Idiofa and Bulungu are operating well below former levels. Hence, food crop marketing is becoming increasingly integrated by firms operating from urban centers of demand.

Two recent marketing developments that have affected the Idiofa Zone stem from the proximity of the booming diamond economy of Tshikapa. First, greater numbers of truckers based in the Kasais are assembling foodstuffs in Idiofa Zone. Comparative wholesale prices for Idiofa and Tshikapa are shown below:

Commodity	Idiofa Price	Tshikapa Price
Milled rice	450	500-700
Maize	150	700-1000
Peanuts	150	600
Manioc	120-150	300-400
Mature Bull	4000-6000	17,000

Although the roads between Idiofa and Kasai Occidental are poor and transport costs are consequently high, there is clearly a strong economic incentive for Kasai traders to buy food crops in Idiofa. A second marketing development is the trucking by Kinshasa based traders and transporters of consumer goods and fuel from the capital to Tshikapa, assembly of foodstuffs at the farmgate in Idiofa Zone, and back-hauling of this produce to Kinshasa. Profitable opportunities for selling consumer goods in Tshikapa, coupled with wide food crop price differentials between Kwilu Subregion and Kinshasa, are contributing, therefore, to further integration of agricultural and consumer goods marketing by Kinshasa-based firms.

Improvement of the roads in the 026/028 project areas will reinforce the trend toward integration of agricultural marketing by lowering transport costs and improving access for urban based traders and transporters. Firms in Idiofa and Bulungu Zones will also face lower costs, but many of them will need better access to credit, vehicles, spare parts and fuel in order to fully benefit from the road improvements. Since many small and medium sized traders are operating highly depreciated vehicles at low rates of utilization, they will be less better equipped to compete with traders coming from Kinshasa and Kasai Occidental.

D. Changing Land Use and Cropping Patterns

Rapidly expanding demand for foodstuffs in Kinshasa and the completion of the paved road from Kinshasa to Kikwit in 1977 spurred food crop production in Bulungu and Idiofa Zones in the late 1970s and early 1980s. As shown in Table 6, cultivated land as a proportion of total land area in Idiofa Zone increased from 1.4% in 1970 to 13.1% in 1981 and 20.9% in 1982. In striving to put more land under cultivation, rural producers are cutting and burning

TABLE 6

ESTIMATED AREA UNDER CULTIVATION IN IDIOFA AND BULUNGU
ZONES (IN HECTARES)

	<u>Manioc</u>	<u>Rice</u>	<u>Coffee</u>	<u>Idiofa Zone</u>		<u>Cultivated Area</u>
				<u>Area</u>	<u>Total land</u>	
				<u>(cols 1-3)</u>	<u>Area</u>	<u>Total land Area</u>
1970	26,289	812	N.A.	27,641	1,926,800	1.4%
1980	146,890	27,120	N.A.	174,010	1,926,800	9.0%
1981	238,182	12,035	2310	252,527	1,926,800	13.1%
1982	383,569	16,327	2947	402,843	1,926,800	20.9%

<u>Bulungu Zone</u>						
	<u>Manioc</u>	<u>Rice</u>	<u>Coffee</u>	<u>Area</u>	<u>Total land</u>	<u>Cultivated Area</u>
1981	147,841	8,145	3,867	159,853	1,200,000	13.3%
1982	161,724	11,744	6,049	179,517	1,200,000	15.0%

Note: The calculations of area cultivated assures that Manioc, rice and coffee are never intercropped and that other major crops (maize, peanuts, squash, voandzou, yams, sweet potatoes) are intercropped with manioc. This method for estimating area cultivated should be interpreted as a lower bound. See Reid (pp. 65-68) for a fuller discussion of Methodologies for estimating land area under cultivation.

Source: Department of Agriculture estimates; Elizabeth Reid, Socio-Economic Baseline Survey for the Kwilu Road Building Component of the Agricultural Marketing Development Project, 1982.

down forests, where soils are initially more fertile than in the sandy savannah areas of Kwilu. This short run response to price incentives is likely to have negative long run consequences on soil fertility, as uncontrolled burning and heavy soil erosion are depreciating the soil resources of Kwilu Subregion. The fertility of recently cleared land is typically exhausted after two growing seasons, so cultivators must clear other forested areas. This newly cleared land is usually farther from the villages, and farmers must spend more time walking to their fields in order to cultivate it. Recently forested land typically has to be left fallow for three to five years before recovering its fertility. Fields in savannah that have been cultivated for several years are usually left fallow for longer periods, often for as long as twenty years. Crop rotation can lengthen the period during which economic cultivation can take place, but much of the exhausted soil never reattains pre-cultivation levels of fertility. In the final analysis, putting more land under cultivation during the past few years is leading to more rapid than usual deforestation and to continued decreasing availability of land of higher than average fertility in the Kwilu Subregion.

Production of palm oil has declined in Kwilu Subregion during the past few years, as palm fruit cutters have shifted increasingly from palm cutting to food crop cultivation. Palm cutters are invariably men, who have responded to the strong incentives for cultivating food crops provided by rapidly rising agricultural prices. Food crops have traditionally been cultivated exclusively by women, so this shift of male labor from palm cutting to food crop production represents a significant change in rural households' patterns of labor allocation. The large palm oil producing firms, such as CCB, PLZ and Fernandes, have attempted to stop the steady downward trend in palm production by offering cutters higher prices per basket of palm fruit during the last year. This has had little impact, however, in light of the rapid manioc, maize, peanut and upland rice price increases of 1982-83.

Some individuals interviewed during the field trip to Idiofa and Bulungu Zones argued that most of the shift in labor allocation from palm cutting to food crop production has already taken place, and that agricultural producers are presently working at maximum or near maximum capacity. Yet the expansion in agricultural labor supply has not kept pace with increases in urban demand. While there is some evidence that urban growth rates are slowing in Kinshasa and Kikwit, most interviewees reported that rural to urban migration is still common among able-bodied males, who otherwise could put more land under cultivation and increase food crop output. The ratio of men to women in Idiofa and Bulungu Zones was 77:100 and 64:100 respectively in 1982, which is indirect evidence of substantial outmigration.

If the above arguments are true, then it is possible that food crop supply in Kwilu Subregion is now relatively inelastic and that further production increases will only be induced by very large price increases or by an expansion of the labor supply. Some informants report that there has been reverse migration of able-bodied males from urban to rural areas in response to price incentives to increase agricultural production. The extent to which this is taking place is unknown. Migration needs to be monitored in the project zone, since the effects of permanent and seasonal migration upon agricultural labor supply and production potential are very important.

The evaluation team was in the field too short a time to assess the validity of the above arguments, but it may well be that the largest increases in food crop production in Idiofa and Bulungu Zones have taken place during

the past two to three years. Rapid rises in agricultural prices in 1983 could be evidence of inelastic supply response, but they clearly reflect expanding urban demand. Unfortunately, agricultural production data, which invariably show strong upward trends, are of questionable reliability and typically reflect production targets rather than actual increases in output. Moreover, reliable estimates of supply elasticities by commodity for Kwilu Subregion are unavailable. In the absence of reliable baseline data, forecasts of production response are speculative at best. The food supply situation for Kwilu Subregion should be monitored carefully by USAID in order to supplement the questionable agricultural production estimates of the DOA. The USAID-funded nutrition project (660-0079) could, for example, monitor land use patterns and agricultural production at the village level at the same time that it monitors household nutrition.

While supply elasticities and potential production response are uncertain, there is little doubt that the 026/028 interventions will help to encourage deforestation and increased cultivation of arable land. Improved access will increase competition for foodstuffs, which will bid up prices and provide producers with strong incentives to put more land under cultivation. This could have a negative long run effect upon soil fertility. Commercial fertilizers may need to be applied to the exhausted soils within the next decade in order to maintain present agricultural production levels. This outcome is by no means inevitable; an increasing livestock population and manure supply (if properly managed and utilized) could offset in part declining fertility. The BDD, the DPP and CODAIK are presently promoting livestock production in Kwilu Subregion. Such efforts need to be continued and supported by the donor community.

One additional shift in the cropping pattern which may occur in the next few years in Kwilu Subregion is increased planting and (after a five year lag) production of coffee. Coffee is presently commanding very high farmgate prices (7.5-10.0 Zaires/kilogram), as buyers compete to acquire a commodity which can be sold on international markets for foreign exchange. The evaluation team was unable to ascertain if planting of new coffee trees is increasing, but projects 026/028 should attempt to monitor coffee production. The potential for increasing coffee production is limited in areas of sandy soils in the Kwilu Subregion, but there probably is potential for expanding coffee production in forested zones. It is possible that labor allocated to palm cutting could be shifted to coffee production. Shifts in labor allocation resulting from increased coffee production may affect rural households' income and nutrition.

E. The Impact of Road Improvements Upon Rural Household Nutrition

CEPLANUT, in cooperation with USAID, conducted a nutritional survey in Bandundu in May 1983. Preliminary findings suggest that the incidence of malnutrition among children is highest in forested areas and second highest in areas near roads in the Kwilu Subregion. Although the CEPLANUT survey generated data on the incidence of malnutrition, it generated little information that could be used to analyze the causes of such malnutrition. Malnutrition is a reflection of households' consumption and investment priorities, which are influenced by such considerations as:

- o knowledge of nutritional requirements (or lack thereof),
- o cash needs for meeting emergency expenditures, paying taxes and

- o school fees, and purchasing consumer goods and discretionary items,
- o household labor requirements for agriculture (including herding), and needs for children's labor inputs
- o judgements as to the likely future returns from educating children.

While there is no direct causal relationship between road improvements and malnutrition, better access provides rural households with greater opportunities to sell agricultural produce and buy consumer goods. In many cases in Bandundu rural households near roads have apparently elected to sell proportionally more of their crops, using the revenues to buy consumer goods and higher cost food (which is often processed), as well as to pay school fees and taxes. Missionaries in Bulungu Zone report that most of the peanut crop is presently sold to traders for shipment to Kinshasa, which has a negative impact upon nutrition in rural areas, particularly upon children's intake of vegetable protein.

Project 079 has fielded a team that will work with CEPLANUT to reduce rural malnutrition through educational programs targetted on women who are both mothers and agricultural producers. This promises to be an important and useful intervention that will alert rural women to the nutritional consequences of selling agricultural produce and using the revenues for buying less nutritional processed foodstuffs. Unfortunately, Project 079 will not monitor rural households' agricultural production, sales, consumption and expenditure patterns over time. It is only with this data that the seasonality and causes of rural malnutrition can be fully understood.

F. Agricultural Input Supply

Producers procure agricultural tools through mission organizations, such as the DPP and the BDD, at stores in the larger towns of Kikwit, Bulungu and Idiofa, and very irregularly at rural canteens. Tools are typically not supplied to rural areas by traders in Kwilu Subregion. Traders report that they lack the working capital to buy tools (which are purchased in Kinshasa), that they prefer to buy and sell consumer goods rather than tools, that tools tie up capital for long periods, that it is difficult to monitor sales and inventory of tools, and that demand for tools, whose prices have risen recently, is highly seasonal. Producers purchase machetes, coupe-coupes, and short-handled hoes during the dry season (May-July) when land is cleared and in anticipation of the onset of the rainy season. In order to supply rural areas, therefore, traders need to ship tools out to the villages when they assemble agricultural produce. Several traders complained that they have so much difficulty monitoring purchases of foodstuffs by their buying agents that they do not want to bother with tool sales. Upgrading rural roads should indirectly improve producers' access to agricultural tools. However, it will be necessary to provide many traders with the working capital to purchase and distribute tools. CODAIK is planning to collaborate with its shareholders in facilitating tool distribution. If CODAIK is successful, then better tool distribution could in part be attributed to USAID funded road improvements.

CODAIK is also promoting distribution of agricultural seeds and vegetative material in coordination with the subregional agricultural extension service. The PNR (based in Kikwit), mission organizations (such as the agricultural program at Lusekele) and a few traders (e.g., Mboliaka) distribute improved seeds (e.g., rice, maize, and vegetable seeds). Most traders do not distribute improved seeds, however, despite complaints about

seed degeneration. In lowering transport costs, projects 026/028 could indirectly improve seed distribution, but local organizations will need more resources for acquiring improved vegetative material. The regional agricultural extension service will also need to shift its emphasis from coercing producers to satisfy administratively decreed land cultivation requirements to extending improved varieties and cultural practices. Finally, producers' perceptions will have to change fundamentally. During the colonial period cultivators received improved seeds for free from the Belgian run extension service. Many producers remember this and feel that they should receive better varieties from the DOA without charge. This attitude may undermine attempts to induce producers to buy improved seeds. Wide distribution of improved seeds may need to be subsidized by development organizations such as CODAIK, at least initially.

G. The Supply Situation for Vehicles, Spare Parts and Fuel

As discussed in section C, the organization of agricultural marketing in Kwilu Subregion appears to be changing due to small and medium sized traders' difficulties in procuring vehicles, spare parts and fuel. Firms in Kinshasa, particularly larger, well-financed ones, are able to obtain transport inputs, while small and medium sized firms appear to be operating well below capacity, because they lack access to these critical inputs. Spare parts and vehicles are not readily available in the major towns of Kwilu Subregion (Kikwit, Bulungu, Idiofa). Transporters often have to go to Kinshasa to buy spare parts. Many smaller firms in Idiofa, Bulungu and Kikwit are presently operating only one or two trucks as opposed to the three or four they were able to operate several years ago. These firms have difficulty procuring new trucks, owing to unavailability of credit.

As the value of the Zaire has deteriorated relative to hard currencies, truck acquisition costs have risen dramatically. In August 1983 it cost 1,080,000 Zaires to buy a new seven-ton Mercedes truck in Kinshasa and 600,000 Zaires to buy a seven-ton Toyota truck. Since small and medium size firms have insufficient capital and access to credit, such purchases can only be financed by the larger firms in Zaire. The cost of spare parts has also risen meteorically in recent months. Fernandes, the largest firm in Bulungu, claims to have replaced a radiator for a ten ton Mercedes ex-military vehicle at a cost of 35,000 Zaires in August 1983 while paying 15,000 Zaires for the same radiator in June 1983. (Fernandes also reports that it has not bought one new truck since 1976. Fifteen of its 23 trucks are ex-military Mercedes vehicles of World War II vintage).

Access to fuel in Idiofa and Bulungu Zones is irregular and inequitable. Large firms with offices in Kinshasa are able to procure most of the fuel sold at official prices. Fuel distributed through official channels is available at Kikwit, Vanga and Dibaya-Lubwe. The fuel is shipped by Shell and Pina via barge to fuel storage tanks along the Kasai and Kwilu Rivers. Fuel is allocated by quota to local firms, with the larger firms obtaining their quota or most of their quota before fuel is sold to smaller firms. Smaller traders and transporters are fortunate to obtain 5-10 200 liter drums of diesel per shipment.

The Protestant missionaries at Vanga distribute fuel for Shell to mission organizations (particularly those that operate hospitals, such as the Catholic Missions at Djuma and Bonga-yasa) and truckers in Bulungu Zone. The

Mission is supposed to receive monthly shipments of 100 cubic meters of diesel and 50 cubic meters of kerosene, but shipments are often bimonthly or even less frequent, particularly during the dry season, when barges cannot safely navigate the Kwilu River. Fernandes and SOZAM receive most of the diesel allocated to the private sector, while smaller firms typically receive no more than 10-20 200 liter drums at any one time. (Fernandes is a major supplier of maize to the DAIPN at Nsele). The last shipment to arrive at Vanga on August 7 was only 60 cubic meters of diesel, and it was allocated exclusively to Fernandes and SOZAM. (The smaller than average shipment resulted from Shell's dispatching of a lower than average capacity barge in order to negotiate the shallow Kwilu River). The previous shipment had arrived at Vanga on May 8. Hence for a three month period during the height of the agricultural buying campaign, no fuel was available at the official price. The fuel distributed by the missionaries was actually sold at 20% above the official price of 3.75 Zaires/liter (prior to the devaluation) in order to cover handling, storage and management costs.

The larger firms in Idiofa Zone obtain fuel at the official price via barge at storage tanks operated by CCB at the port of Dibaya-Lubwe. FINA constructed and formerly managed these reservoirs, which have a 300 cubic meter capacity, but it has now entrusted CCB to distribute the fuel. CCB reports that there are typically three shipments per year of 200-280 cubic meters each, which is grossly inadequate in meeting the larger firms' needs during the agricultural buying campaigns. CCB claims that it alone needs 40-45 cubic meters of diesel per month during the campaign (or 200-225 cubic meters for the April-August period). CCB distributes the fuel only to organizations that have paid for their fuel in Kinshasa. These include CAC and DPP.

While firms such as Fernandes, CCB, CAC and SOZAM are able to obtain much of their diesel at prices near the official rate, small and medium size firms must obtain most of their fuel at the parallel rate, which is typically at least twice as high (7.5-10.0 Zaires/liter in August 1983 before the devaluation). Fuel sold on the parallel market is frequently in short supply. Fuel shortage can cripple the operations of the smaller firms. One transporter based in Bulungu reported that he had been unable to obtain fuel for over two weeks in August, which had impeded purchases of agricultural commodities. Several larger firms based in Kikwit and Idiofa reported that they often have to send trucks to Kenge or Kinshasa to procure diesel at the parallel rate. This immobilizes a vehicle for a period of one to five days, which slows buying operations. Most firms use their vehicles every day for agricultural buying and shipping of food crops and consumer goods. Firms that ship foodstuffs to Kinshasa are able to carry 5 or so fuel drums that can then be filled in Kinshasa and back-hauled to rural areas along with shipments of consumer goods. While small and medium sized traders are able to acquire at least some fuel, limited access to fuel in the Kwilu Subregion raises their overall fuel procurement and agricultural marketing costs.

H. Volume of River Transport

Most of the maize, palm oil and fiber produced in the project area are shipped from Idiofa and Bulungu Zones via barge to Kinshasa and the Kasais. Unlike transport along the Zaire River, which has become increasingly dominated by private firms, most of the traffic along the Kasai and Kwilu Rivers is controlled by ONATRA. ONATRA services the ports of Bandundu, Mangai, Ilebo, Bulungu and Kikwit. Firms which ship produce via ONATRA

complain of delays in shipment, theft and spoilage of goods, and generally poor service. Fernandes, which shipped 6626 metric tons of maize to Kinshasa in 1982, reported average losses of 5-10% per shipment. Although river transport is far cheaper per metric ton than road transport from Kwilu Subregion, poor service and losses deter many firms from using ONATRA barges. Private river transport of agricultural commodities is apparently becoming increasingly common from Mangai and small, non-ONATRA ports along the Kasai and Kwilu Rivers, despite the higher cost of private shipment (30 Zaires per sack via private barge from Mangai to Kinshasa as opposed to 17 Zaires per sack via ONATRA). It is less costly for buyers of agricultural produce to ship maize by private company, assuming a 350 Zaire per sack resale price in Kinshasa, when losses in transit exceed 4.1% of the total shipment.

USAID Project 660-0026 will improve the ports of Panu and Dibaya-Lubwe, which are now serviced by ONATRA but which are not yet ONATRA ports (having ONATRA docking facilities, warehouses and agents). By project completion, however, these ports will become ONATRA ports. ONATRA has restored to operation 1800 metric tons of barge capacity for servicing Panu and Dibaya-Lubwe as part of Project 026. Increased tonnages of agricultural commodities will be evacuated through these ports by firms operating in the northern areas of Bulungu and Idiofa Zones. Yet ONATRA service will need to improve in order to induce many firms to depend primarily upon ONATRA for produce evacuation. Private shipping tonnages have increased in recent years along the Kasai and Kwilu Rivers, even with the difficulties of storing, loading and unloading at Panu and Dibaya-Lubwe and other ports serviced by private transporters. USAID should monitor tonnages of agricultural commodities shipped from Panu and Dibaya-Lubwe by both ONATRA and private transporters over the life of the project. Tonnages shipped from other key ports along the Kasai and Kwilu Rivers should also be monitored in order to determine whether improvement of the ports of Panu and Dibaya-Lubwe merely diverts commodity shipments from other ports or actually leads to increased overall shipments from all the ports serving the project zone.

II. Selection Criteria for Road Improvement

Under projects 026/028 the trunk road from Kikwit to Idiofa will be rebuilt, and the regional roads from Idiofa to Panu (the Eastern Maintenance Road) and from Panu through Bulungu to Kasai (the Western Maintenance Road) will be upgraded. The original project design called for upgrading of Route 223 in place of the Eastern Maintenance Road. It was decided jointly by USAID/Kinshasa, Office des Routes, and Morrison-Maierle that Route 223 was in satisfactory condition, given the relatively low volume of traffic, while the more heavily travelled Idiofa-Panu road, which is in poor condition, merited upgrading. The Idiofa-Panu road is the principal route from agriculturally productive areas in Idiofa Zone to the ports of Dibaya-Lubwe, Mangai, Panu and Ilebo. The economic criteria for changing the "maintenance" road in the eastern zone from the less heavily utilized direct route to the port of Panu to the arterial road which serves all three ports are therefore reasonable.

While the evaluation team does not question the wisdom of this change in rehabilitation plans, it does raise the question of whether USAID and Office des Routes should have elected to upgrade the entire length of either the Idiofa-Panu road (220 kilometers) or the Panu-Bulungu road (132.5 kilometers) in the project design. It is possible that the economic impact of

road improvements would be greater if USAID funded the improvement of several 30-50 kilometer sections of existing roads between productive agricultural zones in northern Bulungu and Idiofa Zones and the ports of Dibaya-Lubwe, Mangai and Panu (and perhaps the port of Ilebo as well). It is unlikely that traders operating in northern Bulungu and Idiofa will truck shipments of maize, peanuts, rice, fiber, and coffee to Kinshasa and the Kasais by road when the less costly alternative of river transport exists. Once the ports of Panu and Dibaya-Lubwe are improved, firms will have further incentive to transport commodities to either Kinshasa or the Kasais by river. From a purely economic standpoint, then, upgrading the entire length of the roads from Idiofa to Panu and from Bulungu to Panu may not be the best use of scarce Office des Routes resources.

From administrative and road maintenance standpoints, though, the decision to improve road links between Idiofa, Bulungu and Panu is sensible. The OR does not operate road maintenance brigades out of points in northern Idiofa and Bulungu Zones, while it does operate units out of Bulungu and will shortly out of Idiofa. Yet it may be possible to place a maintenance brigade in Mangai or some other town along or near the Kasai. Equipment, spare parts and fuel could be transported from Kinshasa to this northern maintenance point by river at significantly lower cost than by road to Bulungu or Idiofa (and on to Kinshasa). At the same time the central OR office in Kikwit might stand to lose considerable control over OR operations in the areas along the Kasai River. This could create opportunities for misuse of equipment, sale of fuel, and other abuses.

Without better information about the potential for expanding marketing of agricultural commodities from the northern areas of Bulungu and Idiofa Zones, it is difficult to judge which roads in the project zone could be improved for maximum economic benefit. Potential for expanding agricultural production for each collectivity and increasing traffic from alternative road upgrading schemes are difficult to predict, given the poor data base. The decision to upgrade key regional roads in their entirety appears to be justified in light of the information gaps. Yet the evaluation team did not find any evidence that an alternative road rehabilitation plan was ever considered.

III. Some Observations on Further Monitoring and Evaluation

A. Introduction

A monitoring scheme for projects 026/028 is elaborated in a separate report, but the evaluation team wishes to comment on selected aspects of monitoring and evaluation in this report. We shall discuss the types of activities and trends that should be monitored, the kinds of information that are feasible to obtain, and ways to go about collecting and analyzing this information.

B. Activities/Trends Requiring Monitoring

In order to gauge the impact of projects 026/028 it will be necessary to monitor:

1. Agricultural production trends by zone and collectivity in the Idiofa and Bulungu collectivities. DOA estimates of area cultivated, production, marketed output and yield should be monitored for manioc, maize, peanuts, upland rice, coffee and palm products. Cropping and land use patterns need also to be monitored. Source of information: Reports prepared by Agronomes du Zone in Bulungu and Idiofa.
2. Population and agricultural population by zone and collectivity in the project area. Particular attention should be paid to shifts in population composition (male-female ratio) and patterns (population by collectivity) induced by road and port improvements. Urban population growth for Kikwit, Idiofa, Bulungu and Kinshasa should also be monitored. Source of information: INS records, Kikwit and Kinshasa.
3. Project road use by vehicle type during two representative periods (height of the agricultural buying campaigns, May-June; middle of the growing season, November-December). Sources of information: Semi-annual traffic counts on project roads, perhaps conducted in cooperation with CODAIK; periodic monitoring of records of vehicle crossings at ferries (e.g., at Bulungu, Tango, Djuma and Pindi on the Kwilu River, at Lusanga at the juncture of the Kwilu and Kwenge Rivers).
4. Tonnages of principal agricultural commodities shipped annually by ONATRA and private transporters from the major ports in the Kwilu Subregion, including Panu, Dibaya-Lubwe, Mangai, Bulungu and Kikwit, as well as Ilebo. Possible shifting of shipping services from existing ONATRA ports or ports serviced primarily by the private sector to newly managed ONATRA ports needs to be monitored, since improving ports may only change the allocation of tonnages between the different ports and not total tonnages shipped by ONATRA and private transporters. Sources of information: ONATRA data base; Departement des Transports et Communications, Groupe d'Etudes, Economie et Planification data base for private river transport.
5. Farmgate, wholesale and retail prices for the following commodities: manioc, maize, peanuts, upland rice, coffee, fiber, squash seeds, and palm. Sources of information: Farmgate and wholesale prices - Informal interviews with producers, traders, missionaries, government officials; monthly reports submitted to CODAIK by shareholders; annual reports of mission organizations. Retail and selected wholesale prices - INS offices in Kikwit and Kinshasa.
6. Supply, distribution patterns and prices for vehicles, selected spare parts and diesel. Sources of information: Informal interviews with traders, transporters, fuel distributors (Vanga Mission, CCB at Dibaya, Shell at Kikwit), sellers of vehicles and spare parts, mission organizations, and local ANEZA offices in Kikwit, Bulungu and Idiofa.
7. Child malnutrition in selected villages near project roads, non-project roads, and several less accessible zones, as well as in forest and savannah areas. Sources of information: Followup CEPLANUT surveys and field work during project implementation; interviews with Project 079 staff and missionaries.
8. Road maintenance for completed project roads, non-project regional

roads (maintained by the OR or contractors to OR), and secondary roads that feed into project roads. Examples of non-project regional roads include the Bulungu-Lusanga-Kikwit road, the Idiofa-Tshikapa road, route 223 (originally slated for upgrading in 026), and the Ngenkong-Dibaya-Lubwa road. The CODAIK funded road maintenance program should be monitored to the extent that it complements 026/028 infrastructural improvements. Sources of information: Field inspections, observations of project and USAID staff, interviews with CODAIK staff.

9. The evolving structure and organization of the trade in agricultural commodities (particularly food crops), consumer goods and agricultural inputs (tools and seeds). The following activities should be monitored: buying and selling practices, capital turnaround time, the relative importance of different buying zones and final markets, the estimated volume of agricultural commodity flows to and from the region, the role and scale of operations of small and medium size traders based in the collectivities, and processing activities. Source of information: Periodic informal interviews with traders, transporters, missionaries, ANEZA and CODAIK officials in the project area.

10. Transport costs of firms operating trucks on project roads. Despite the potential methodological pitfalls of collecting and analyzing this type of data, some effort should be made to tap existing sources of information on transport costs. Sources of information: World Bank appraisal documents for transport projects (e.g. Fifth Highway Loan), CODAIK records and estimates, interviews with transporters, records of selected firms willing and able to record transport costs on a per vehicle basis or for groups of similar vehicles.

11. Traders' and transporters' access to credit for financing acquisition of vehicles, spare parts, agricultural processing equipment and construction materials (for warehouses, depots). The supply of credit for meeting working capital requirements (agricultural produce and fuel purchases) should also be monitored. Sources of information: Informal interviews with traders and transporters, CODAIK records, BCZ and SOPIDE records.

C. Information that would be Costly to Obtain

In order to keep monitoring and evaluation costs at reasonable levels, USAID should probably not attempt to collect the following types of data:

1. Rural household consumption, expenditures, and sale over the course of one or more years. A skillful interviewer may judge it useful to interview selected rural households in the project zone at annual or semiannual intervals, but accurate information on consumption, expenditures and sales can generally not be obtained without using costly longitudinal surveys.

2. Estimates of agricultural production and land area under cultivation in villages near and not near project roads. However imperfect, DOA estimates will have to suffice. The trends shown by the DOA estimates can be cross-checked through informal interviews, although there will

probably be no cost-effective way to verify the magnitude of individual commodity estimates.

3. The complete supply and demand situation for Kinshasa and Kasai Occidental. Commodity flows from Bas-Zaïre, Equateur, Shaba and other regions to these principal markets for foodstuffs exported from Kwilu Subregion will indirectly influence commodity prices and flows in Idiofa and Bulungu Zones. Yet collecting this information would require a series of additional studies. Some understanding of supply and demand for foodstuffs in Kinshasa and Western Kasai will improve USAID's ability to analyze the evolution of the agricultural economy in Kwilu, however.

4. Storage losses on the farm, in rural storage depots and in urban areas. This type of information, though important, is extremely difficult to obtain with any accuracy. Some understanding of storage practices and losses can be obtained through informal interviews and field inspections. The FAO study of the Kwilu Subregion contains estimates of post-harvest losses for some agricultural commodities. Finally, the Peace Corps has developed excellent reference materials on storage techniques which can probably be adapted to conditions in Kwilu Subregion. Further research on storage losses is clearly needed. USAID/ST/AGR can provide technical assistance in the areas of post-harvest losses and storage technologies through ongoing centrally funded projects. Rob Morris of ST/AGR can be contacted for further information.

D. Implementation of Monitoring and Evaluation Program

Most of the monitoring and evaluation activities can be undertaken annually or semi-annually by USAID/DEO in cooperation with monitoring specialists (such as core staff of the Small Farmer Marketing Access Project), locally hired contractors, and local institutions such as the DOA/Bureau d'Etudes, the INS, CODAIK, or perhaps university staff in Kinshasa. The Small Farmer Marketing Access Project intends to develop longer term working relationships with four to six USAID Missions in Africa, Asia and Latin America. Further monitoring and evaluation of USAID/DEO projects in Zaïre and assistance in designing further projects in agricultural marketing in Zaïre are consistent with the SFMA project mandate. From such ongoing involvement in the project cycle with selected USAID Missions, such as the Zaïre Mission, the SFMA Project hopes to improve agency-wide understanding of marketing processes, institutions, constraints and performance. It is hoped that the performance of USAID funded agricultural projects will improve through better knowledge and skill in designing, monitoring, implementing and evaluating marketing interventions.

While it is important that USAID internalize knowledge of marketing processes and interventions, it is also desirable to attempt to institutionalize capability in agricultural marketing in host country institutions. Hence, it would be highly desirable if staff member(s) of the DOA/Bureau d'Etudes, the INS, or perhaps the local university could collaborate with USAID in monitoring and evaluating USAID agricultural marketing projects in Kwilu Subregion. The future presence of at least one member of the Bureau d'Etudes on USAID monitoring/evaluation teams is desirable. Enlisting the cooperation of INS staff to assist USAID in analysis

of retail and wholesale price data for Kikwit and Kinshasa may also be useful. USAID evaluators, such as core staff from the Small Farmer Marketing Access Project, could periodically review monitoring activities undertaken by the Bureau d'Etudes or INS for methodological soundness, consistency, and analytical quality. Contractors to the USAID funded project 660-0070 could also collaborate with Bureau d'Etudes staff in analyzing and interpreting agricultural production and price data.

If USAID decides to fund other projects in Kwilu Subregion, then the Mission may deem it useful to fund an ongoing monitoring and evaluation scheme in the Bureau d'Etudes. The Bureau d'Etudes could set up a computerized data base which could include information on agricultural production and prices, population, transport and road maintenance costs, commodity flows, and imports/exports of agricultural commodities for western Zaire, and in particular Kwilu. This data base could be supplemented by periodic, joint USAID-DOA monitoring and evaluation missions that would conduct informal interviews and field inspections. In the case of multiple interventions, it is methodologically far more valid to monitor and evaluate changes in the regional agricultural economy in order to determine the joint impact and effectiveness of these interventions rather than trying to assess the effect of any one project. The impacts of individual projects are rarely separable, particularly in the dynamic and rapidly evolving macroeconomic and regional agro-economic environments characterizing western Zaire today.

A final procedural recommendation for monitoring and evaluating USAID projects in Kwilu is to "centralize" all available trip reports, baseline studies, project documents, data and evaluation reports in one file or location in the AID library. Future studies and reports should be filed with this material. In addition, it might be useful for USAID/Kinshasa staff to keep a log of field observations and information gleaned during field trips and interviews for facilitating the task of monitoring and evaluation. Monitoring and evaluation teams are handicapped in that they visit project areas at one point in time rather than periodically and at different times of the year. Additional information and observations, even when not in the form of polished trip reports, will aid project evaluators.

IV. Summary of Recommendations

1. Monitor population and migration.

There are fewer men than women in the project area, where women are the usual cultivators. Monitoring of population and agricultural population by zone and by collectivity in the project area will indicate shifts in population composition (male-female ratio) and patterns (population by collectivity) induced by road and port improvements. Urban population growth should be monitored for Kikwit, Idiofa, Bulungu and Kinshasa. These data will help indicate whether the food crop supply is relatively inelastic, in which case further production increases will only be induced by very high prices or by expansion of the labor supply. Perhaps there will be reverse migration (urban to rural) in response to price incentives.

2. Monitor land use patterns and agricultural production.

Because agricultural production data from the DOA are probably highly inaccurate, reliable estimates of supply elasticities by commodity for the Kwilu Subregion are not available. Therefore it becomes extremely difficult to forecast production responses. USAID should carefully monitor agricultural production trends by zone and by collectivity in Bulungu and Idiofa. Area cultivated, production, marketed output, and yield should be monitored for maize, manioc, peanuts, upland rice, coffee and palm products. The USAID funded nutrition project (660-0079) could monitor village cropping, land use patterns and agricultural production at the same time it monitors household nutrition at the village level.

3. Encourage soil management.

If present agricultural practices are followed while more land is put under cultivation, there will be a negative long-run effect upon soil fertility. Efforts to prevent declining fertility should be supported by the donor community. These efforts could include the application of commercial fertilizers and the proper management and utilization of manure supplies from increasing livestock populations.

4. Monitor shifts in coffee production.

Coffee is presently commanding high farmgate prices as a commodity which can be sold on the international market for foreign exchange. Labor allocated to palm cutting could possibly be shifted to coffee production. These labor shifts may affect rural households' income and nutrition.

5. Generate data for analyzing causes of child malnutrition.

A CEPLANUT survey has generated data on the incidence of malnutrition, and Project 079 will work with CEPLANUT to reduce rural malnutrition through womens' educational programs. However, data obtained by monitoring rural households' agricultural production, sales, consumption and expenditure patterns over time will be needed to fully understand the seasonality and causes of rural malnutrition.

6. Make available improved seeds.

Local organizations need more resources for acquiring improved seeds and vegetative matter. Wide distribution of improved seeds may need to be subsidized by development organizations.

7. Monitor barge use.

USAID should monitor the tonnages of agricultural commodities shipped by barge from Panu and Dibaya-Lubwe ports during the life of the project. Tonnages should be monitored for both ONATRA and private transporters. Other ports along the Kasai and Kwilu rivers should be monitored to determine whether improvement of Panu and Dibaya-Lubwe diverts commodity shipments from other ports or actually leads to increased overall shipments of commodities from the project area.

8. Cooperate with SFMA for monitoring and evaluation of projects.

The Small Farmer Marketing Access Project (SFMA) cooperates with USAID missions to improve agency-wide understanding of marketing processes, institutions, constraints and performance through its involvement in project design, monitoring and evaluation. USAID/Zaire should continue its collaboration with this project.

9. Collaborate with Zairian institutions to monitor and evaluate USAID agricultural marketing projects.

The Bureau d'Etudes or INS could become involved with project monitoring and evaluation as a method of institutionalizing capabilities for agricultural marketing analysis. If the Bureau d'Etudes collaborates with USAID and SFMA staff on project monitoring, evaluating and data collection, this will improve the data resources available and provide long-term skills for the local institutions participating in the studies.

10. Centralize relevant project documents.

All the trip reports, baseline studies, project documents, data and evaluation reports should be filed in one location at the USAID library. USAID/Kinshasa staff should keep logs of field observations and information gathered to facilitate monitoring and evaluation.

11. Monitor agricultural prices.

Agricultural prices in the project area should be monitored for farmgate, wholesale and retail prices of manioc, maize, peanuts, upland rice, coffee, fiber, squash seeds and palm products.

12. Monitor road usage and maintenance.

Project road use by vehicle type during two representative periods (the height and middle of the growing season) should be monitored, as should the transport costs of firms operating trucks on project roads. Road maintenance for completed project roads, non-project regional roads and secondary roads that feed into project roads should be monitored.

13. Supply, distribution patterns and prices for vehicles, selected spare parts and fuel should be monitored, as should the changing structure and organization of trade in agricultural commodities, consumer goods and agricultural inputs. Buying and selling practices, capital turnaround time, the relative importance of different buying zones and final markets, the estimated volumes of agricultural commodities to and from the region, the role of small and medium sized traders, and processing activities should also be subjects for investigation.

14. Traders' and transporters' access to credit for financing vehicles, spare parts, construction materials, commodity purchases, fuel and agricultural processing equipment should be monitored.

TABLE 7
WHOLESALE PRICES FOR MANIOC COSSETTES BOUGHT IN IDIOFA ZONE AND SOLD IN
KINSHASA, JANUARY - AUGUST 1983
(IN ZAIRES/60 KG. SACK)

<u>MONTH</u>	<u>AQUISITION PRICE</u> <u>AT THE FARMGATE</u>	<u>SALE PRICE</u> <u>IN KINSHASA</u>
January	60	200
February	60	200
March	60	200-210
April	60	200-220
May	60-65	220-250
June	60	200
July	120	280
August	120	300

Source: Ets. Ele, Idiofa. Ele is a CODAIK shareholder who obtained an eight ton Chevrolet truck on credit from CODAIK. He is required to submit monthly reports to CODAIK which describe the use of the GM vehicle.

TABLE 8
QUANTITIES OF COMMODITIES BOUGHT BY DPP, 1979-1983
(in metric tons)

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983 (a)</u>
Paddy	800	1250	1150	611	1120
Coffee	102	42	238	91	60
Manioc	89	11	105	483	N.A.
Peanuts	32	31	35	61	N.A.
Millet	30	8	1	-	-
Maize	51	14	30	43	28
Soya	-	-	0.8	5	-
Voandzou	2	5	3.5	0.8	-

Source: DPP Records

(A) Buying of manioc and peanuts has not been completed for 1983.

TABLE 9

DPP SALE PRICES FOR SELECTED AGRICULTURAL COMMODITIES IN IDIOFA, 1983
(in Zaires per kilogram)

	<u>January</u>	<u>May</u>	<u>August</u>
Manioc	1.8	2.2	2.4
Rice	5.7-6.0	9.0	9.0
Maize	-	1.5	2.5
Millet	1.0	-	3.0-3.6
Peanuts	3.5-3.8		

Source: DPP records

SECTION 2: TECHNICAL EVALUATION

TECHNICAL EVALUATION INDEX

- I Technical description of the projects.
 - II Differences in road work proposed in the two projects.
 - III Differences in technical assistance proposed in the road upgrading portions of the two projects.
 - IV Historical review of the roads portion of the projects through June 8, 1983.
 - V Status of the roads portion of the projects at evaluation time.
 - VI Institutional environment for roads portion of the projects.
 - VII Technical assistance within the roads portion of the projects.
 - VIII Reporting procedures within the roads portion of the projects.
 - IX Conclusions concerning the roads portion of the projects.
 - X Probability of completing the roads portions of the projects within the present funding.
 - XI Maintenance of roads in the Kwilu area.
 - XII Status of the bridge portion of project 026.
 - XIII Status of the port improvements portion of project 026.
 - XIV Status of the barge improvements portion of project 026.
 - XV Recommendations.
- Annex A. Quarterly report content.

TECHNICAL EVALUATION OF THE AGRICULTURAL MARKETING DEVELOPMENT PROJECTS
(660-026 and 660-0028)

I. TECHNICAL DESCRIPTION OF THE PROJECTS

1) Loan 660-T-026 consisted of the following technical inputs:

a) Provision of essential road maintenance equipment to permit improvement of selected priority roads in the project area through the rehabilitation of existing out-of-service equipment and the purchase of additional new equipment to complement the rehabilitated equipment in the rejuvenation of two independent road maintenance units;

b) Provision of additional spare parts and technical services for the road maintenance upgrading program envisioned above;

c) Provision of equipment and materials to facilitate construction of about 200 meters of short-span, small bridges on agriculturally important roads other than the selected priority roads designed in section (a) above;

d) Improvement of two ports, PANU and DIBAYA-LUBWE, following their official designation as ONATRA ports, ONATRA being the official GOZ water transportation agency; and

e) Overhaul and return to service of 1800 tons, net capacity, of out-of-service barges belonging to ONATRA.

2) Loan 660-T-045, for project 660-0028, consists of the following technical inputs:

a) Provision of road construction and maintenance equipment to enable the establishment of an independent heavy-road brigade to maintain, improve and construct the road between Kikwit and Idiofa and the improvement or construction of approximately 50 km. of feeder roads to provide access to this main arterial road;

b) Provision of spare parts and technical services for the heavy-road brigade envisioned above;

c) Renovation of workshops and dormitories for trainees and construction of classrooms at a new training facility in Lubumbashi; and

d) Provision of a chief Technical Advisor/Engineer to function as the Training Center's Director and two other instructors, a master mechanic and an equipment operator, for 24 months.

II. DIFFERENCES IN ROAD WORK PROPOSED IN THE TWO PROJECTS

1) Loan 660-T-026, Project Paper Annex R-5, graphically illustrates the intent and scope of the project's envisioned improvements. Two sections are

shown and described. Section A indicates that existing (in-place) road bed soils which contain sufficient soil binder (clay) should be reworked (improved) by mechanized shaping, watering, and compaction. The text indicates that soils of this nature constitute 80 to 90% of the roads in the project area.

Mechanized shaping is normally considered as a routine maintenance function. It means that a grader routinely passes over an existing roadway to restore the original shape of the road. This accomplishes two objectives. The restoration of the road's cross slopes insures that water will flow to the sides of the road rather than remain on the roadway itself where, in the presence of traffic, water-retaining pot holes form. Retained water adversely affects the structural integrity of the road. The grader also smooths out the corrugations which always occur when traffic is present. These corrugations, unless controlled, affect the rideability of the road and therefore increase the user's cost of travelling over the road, both in increased travel time and in increased vehicle repair costs.

Watering and compacting the roadway represent an additional cost which is usually incurred in the original construction of a road. Its purpose is to increase the structural strength of the roadway, thereby reducing the frequency of routine mechanized reshaping and consequently reducing routine maintenance costs. In the case of the project roads, which have not previously been compacted except by passing vehicles, this activity is an attempt to reduce rutting due to traffic compaction so that future routine mechanized reshaping will be possible.

Section B represents the activity which must take place when the existing soil is deficient in clay binder. This condition exists in most of the remaining 10 to 20% of the roads in the project area. It calls for the addition of select borrow material which is then properly shaped, watered and compacted. This activity is similar to an activity known as periodic maintenance, which usually occurs when a road surface has lost most of its ability to function properly. It is commonly called re-charging a road or, in the case of a gravel road surface, re-gravelling the road.

Both activities are intended to bring the selected roads to a "good earth road" condition. Earth roads are only suitable for low-traffic volumes and usually contain only enough culverts to carry live streams (flowing water) under the roadway. The use of culverts to carry surface water (rainfall) under the road is seldom economically justified, so depressions in the roadway or humps (small dams) are used to move water across the road.

Neither section purports to represent an all-weather road because of the difficulty of draining longitudinally flat roads which exist in a depressed alignment. Neither section suggests any widening of the existing roadway since "good earth roads" are intended primarily to provide access at minimum cost, including minimum maintenance costs.

2) Loan 660-T-045, Project 660-0028, proposes an entirely different approach to the Kikwit-Idiofa route. The purpose of this project is to provide a prototype all-weather connection between those two locations because of the arterial nature of the route. The suggested design features are completely drainage orientated, using specific design criteria to insure the

rapid removal of surface (rain) water, while ignoring other geometric design standards which would increase the cost of the road without improving its all-weather access capability.

The basic concepts include the elevation of the roadway above the surrounding terrain in flat areas by realigning the roadway and using side borrow not only to elevate the road but also to provide drainage area. The project documentation includes widening the roadway in areas where realignment is not economically practical, not only to provide for side drainage ditches but also to accommodate the higher traffic volumes and to spread the wheel loading over more of the road surface. A granular surface is to be provided to further protect the road surface from excessive rutting.

Eighteen kilometers of concrete lined ditch are included to provide positive drainage on the uphill side of problem areas and 150 culverts complete with headwalls are provided to pass rain-water under the roadway.

III. DIFFERENCES IN TECHNICAL ASSISTANCE PROPOSED IN THE ROAD UPGRADING PORTIONS OF THE TWO PROJECTS.

1) Loan 660-T-026 is to provide technical assistance in the form of two instructor/mechanic/operators and a technical advisor/team leader. The trainers are to work with the two maintenance units' personnel to improve their job performance and understanding of the particulars of the specific equipment assigned to their maintenance unit. The technical advisor's function is to oversee the trainers, plan the execution of the project road rehabilitation program, and to ensure that the program is executed according to schedule.

2) Loan 660-T-045, for project 660-0028, is to provide technical assistance in the form of an experienced highway engineer capable of taking effective control of a newly created self-contained unit to be staffed with completely trained zairian personnel; and to ensure that the prototype road is constructed to the criteria envisioned in the project paper and further amplified in a Technical Report - Road Upgrading Operations prepared for this project. That paper specifically stipulates that the project is not to be undertaken as a training operation because of the time, financial, and equipment constraints. The project paper also included a master mechanic to service only project equipment. This limited activity would give the master mechanic time to promote routine equipment maintenance, control spare parts, maintain complete equipment records, and work with operators who are abusing the equipment.

IV. HISTORICAL REVIEW OF THE ROADS PORTION OF THE PROJECTS THROUGH JUNE 8, 1983.

1) The project paper for Project 660-026, to be referred to in this review section as the "maintenance project", was prepared in July, 1979.

2) The project paper for Project 660-028, referred to as the "reconstruction project" in this review section was prepared in September 1981.

3) During the period between March and June, 1982, an Office des Routes (OR) directive was issued and implemented changing the institutional configuration of the brigade concept (see section VI, Institutional Environment) from an autonomous body to a part of a larger production unit and delegating the administrative responsibilities to a centralized unit.

4) A U.S. consulting engineering firm, Morrison-Maierle, Inc., (M-M) contracted with OR, the national roadbuilding institution, to provide a Technical Assistance (TA) team for the "maintenance project". M-M received notice to proceed on July 9, 1982.

5) On October 31, 1982 the M-M team arrived in Zaire and during the period between December 12-20 the team moved its operations to Kikwit.

6) During the week of January 18, while the M-M instructors were working on equipment rehabilitation, the team leader and a TDY engineer from the M-M home office began to inventory the "maintenance project" roads. At that time it was suggested that it would be difficult to run a "maintenance project"

unit from Idiofa since the "reconstruction project" road between Kikwit and Idiofa was in such bad shape. The possibility of exchanging project roads was discussed. Subsequently, on January 28, 1983 the M-M inventory team returned to inventory the "reconstruction project" road.

7) On February 7 M-M submitted its preliminary report to OR and USAID, including a work schedule for two "brigades" called the Idiofa Brigade and the Bulungu Brigade, which are in fact non-existent entities. Under OR's revised field organization, the Idiofa based part of Production Unit (PU) 250 provides the resurfacing capability for the whole project area while the Bulungu based part of PU 250 provides the reprofiling capability for the whole project area. This report was translated at the M-M home office and submitted on April 4.

The inventories included the following roads:

<u>ROAD SECTION</u>	<u>INVENTORY DATE</u>	<u>LENGTH</u>
<u>"Reconstruction" Project</u>		
Kikwit to Idiofa	28 Jan. 83	130.0 km
<u>Western "Maintenance" Route</u>		
Route I (Kasai) to Bulungu	29 Jan. 83	63.5 km
Bulungu to Mosele II	19 Jan. 83	108.5 km
Mosele II to Panu	18 Jan. 83	24.0 km
<u>Eastern "Maintenance" Route</u>		
Idiofa to Ngenkong	11 & 16 Jan 83	83.0 km
Ngenkong to Mangai	17 Jan 83	38.0 km
Mangai to Pio Pio River	17 Jan 83	22.0 km
Pio Pio River to Ovekenenne	18 Jan 83	22.0 km
Ovekenenne to Mosele II	18 Jan 83	55.0 km
<u>Partial Inventory, Eastern Area</u>		
Idiofa to Ovekenenne	18 Jan 83	105.0 km

A review of the inventories, which describe the planned improvements by kilometer and estimated days of work by kilometer, indicates that M-M planned to include culverts for surface water on all inventoried roads and planned to shape, water and compact all existing alignments, adding resurfacing material only where necessary, with no formal cross section control on any of the proposed work.

The work schedule, included as table 3-4 of the preliminary report and amplified in tables 3-5 through 3-9, indicates that the "Idiofa Brigade" would begin work on the "Reconstruction Project" road (Idiofa-Kikwit) in February 1983 and complete work on that section in June of 1985, after which it would do the Mosele II to Panu section of the "Maintenance Project" western route, completing that portion in November 1985.

The "Bulungu Brigade" would begin work on the "Maintenance Project" western route in July 1983 reaching Bulungu in June, 1984, and completing the western route at Mosele II by December 1985.

This represents a change in project routing under the "Maintenance Project" funding. The original western "Maintenance Project" route was retained (196 km), the "Reconstruction Project" route was added (130 km), and the eastern "Maintenance Project" route was deleted (220 km). The eastern "Maintenance Project" route as modified in the preliminary report from its original 160.0 km length, was to be built at such time as the funding and equipment became available under the original "Reconstruction Project" loan.

8) On February 15 work actually began on the "Reconstruction Project" route with funding originally provided for the "Maintenance Project".

9) On February 21 OR officially requested the Kikwit-Idiofa road (the "Reconstruction Project") be rehabilitated with part of the "Maintenance Project" funding and that funding for the "Reconstruction Project" be devoted to the rehabilitation of the Idiofa - Ngenkong - Mangai - Ovekenenne - Panu road rather than the Idiofa - Ovekenenne - Panu road. Thus the eastern "Maintenance Project" routing was not only deleted from the "Maintenance Project" funding and transferred to the "Reconstruction Project" funding, but was also relocated because the original eastern "Maintenance Project" road was considered to have been in good condition.

This request was agreed to in a letter from AID dated 2 June, 1983, which also transferred the 50 km. of feeder roads to be constructed adjoining the Kikwit-Idiofa road to the Idiofa-Panu road.

10) On May 10-13, USAID personnel, accompanied by John Morrison, President of M-M, visited the work site. Until this visit AID believed that the work being performed on the Kikwit-Idiofa road was being done as originally proposed (as a reconstruction activity). This belief was based on the facts that parts of the Technical Report - Road Upgrading Operations prepared for the "Reconstruction Project" had been given to M-M at the time of their inventory and that copies of all documentation had been routinely transmitted to OR.

M-M on the other hand believed that they were to do the work on the "Reconstruction Project" as modified by their inventory submitted as part of the preliminary report which had been accepted by OR and AID. The regional technical director for OR had further reinforced M-M's belief that the "Reconstruction Project" requirements were not in force by instructing the M-M technical advisor/team leader as to the exact manner in which the work was to be carried out.

During the visit, the USAID personnel verbally informed M-M that the road was not being constructed to the "Reconstruction Project" specifications.

11) On May 16 discussions were held in Kinshasa between USAID, M-M, and OR headquarters personnel. The discussions centered on the project operations but the subsequent report does not indicate that specification problems were a topic at that meeting.

12) On June 8 AID circulated a memo which put all parties on notice that the construction was not proceeding according to project specifications.

V. STATUS OF THE ROADS PORTION OF THE PROJECTS AT EVALUATION TIME.

1) Work was continuing on the Kikwit-Idiofa road. The equipment available consisted of:

- 1 Komatsu Bulldozer equivalent to a Cat D-6
- 1 Fiat Bulldozer equivalent to a Cat D-6
- 2 Champion 562 graders
- 2 W 24 Case Loaders (2.25 CM)
- 1 W 18 Case Loader (1.75 CM)
- 1 Sakai Vibratory Compactor
- 1 Bros 3000 Pneumatic Compactor
- 15 Dump trucks
- 1 Water truck

The OR personnel provided for the construction activity include:

- 2 Foremen
- 1 Soils Technician
- 2 Bulldozer Operators
- 2 Grader Operators
- 2 Roller Operators
- 3 Loader Operators
- 16 Drivers
- 4 Laborers without tools
- 6 Guards
- 1 Chief Mechanic
- 4 Mechanics
- 1 Mechanics Helper

2) The road construction can best be described as unique. The existing material is randomly shaped by a grader within the confines of the existing roadway width as delineated by the existing side slopes. Truck loads of bony (many large stones) gravel are dumped at intervals of 2.1 meters along one side of the road. This attempt at controlling the thickness of the surface is of course negated by the varying width of the road. A grader spreads several truckloads across the road distorting the cross section of the road to some semblance of a crown and wasting an undetermined amount of material in a berm within or adjacent to the existing cut faces. The material is tested with a speedy moisture meter to determine the need for additional water. The vibratory roller then begins to roll the material from the low side up in order to form a parabolic cross section tipped somewhat to the down hill side so that the water on the uphill side will run across the road to the down hill side where, ideally, it will find its way to the nearest existing miter drain without causing any damage. Once the material (rocks and all) is compacted by 3 passes of the roller, the water truck squirts some water on the finished surface so that traffic can help with further compaction during the night. The next morning the road is compacted again with two roller passes and then rewatered, thereby completing the construction sequence.

No measurements appear to be recorded of the width, the uncompacted thickness, the compacted thickness, the actual cross slope at any given point, or any other feature. There was no indication of where the work crew was actually working since all measurements from the beginning of the project are

made by odometer; however work had progressed to a point beyond km 15 at the time of the evaluation. Several areas had been reworked more than once after a project truck and a passing truck had tipped over because of excess cross slope.

3) When the construction reaches km 16 in the near future (km 16 is easy to identify because it has a switchback at the beginning of a steep hill), it will have passed the location of 47 culverts according to the M-M road inventory. These culverts are not on the job site nor is their anticipated arrival yet known. After the next rainy season these culverts will be installed. The method of installing culverts under a parabolic cross section, so that the existing edge at the section and the invert (bottom) of the culvert both meet the elevation of the existing miter drains, has not yet been decided. Some further reworking of the reworked area is anticipated, however.

4) No attempt to modify the road cross section has been made in response to AID verbal objections to the type of construction being followed in late May. The objections were formalized in a memo dated June 8 which has been sent to OR and M-M. No reply or comments have yet been received by AID. The conditions described above were observed on August 19. The M-M equipment operator specialist/trainer was not at the job site at the time of this inspection and was therefore not interviewed. The evaluation team was accompanied by the M-M team leader.

VI. INSTITUTIONAL ENVIRONMENT FOR ROADS PORTION OF THE PROJECTS.

1) In early 1982, OR centralized all brigade operations. This in effect short-circuited the assumptions made in both project papers that an independent, manageable entity would exist which could be molded into a viable construction or maintenance unit. Accounting and administrative activities were removed to central control to allow brigade chiefs more time for technical involvement. Brigade chiefs were then assigned specific tasks within the context of a production unit. For instance, the former Bulungu brigade became a reprofiling unit specializing in maintenance grading operations through the entire project area, including the area in which the Idiofa group is based.

2) Production Unit 250 covers the entire project area. The regional technical director, M. Le Carre, is in charge of this unit as well as two other production units within the Bandundu Region.

He has no Zairian counterpart in Kikwit. Below him is a Zairian, Cit. Shukulu Mulamba, who is the chief of P.U. 250. He has two assistants, one of whom is Zairian and who, according to M. Le Carre, has the title of First Assistant Production Unit Chief. The second Assistant position, again according to M. Le Carre, was created specifically for the M-M team leader to integrate him into the OR organization. Mr. Loftin, the M-M team leader, received written notification of this appointment into the OR hierarchy. Both assistant P.U. chiefs carry instructions to the former brigade chiefs, now chiefs of specialized activities, who are in charge of the actual field operations but are entirely dependent upon instructions from above.

3) During the evaluation procedure M. Le Carre was asked to define the decision making procedure within the Production Units as they now exist. M. Le Carre says that he makes every technical decision that is made for P.U. 250. Zairian P.U. chiefs are allowed to make suggestions but have no active input in the final decision making process. The assistant chiefs are charged with carrying Le Carre's decisions, as conveyed to them by the Zairian P.U. Chiefs, to the field supervisors.

4) M. Le Carre was also asked for his opinion, as the only decision maker in the field, of the two projects being evaluated. He stated that it is foolish to consider 026 a project, as it is merely assistance to OR to acquire and maintain equipment for doing OR's regular job. He further noted that project 028 is an idealized exercise in highway engineering that cannot be carried out with OR's limited resources. Given the lack of water trucks, fuel, and the presence of a social structure wherein the production employees take time off for any inconsequential cause, an OR brigade would be lucky if it could construct 20 km per year of 028 type road, which has never been attempted anywhere in Kwilu before. He suggested AID should stabilize the soil with cement if they wanted to build that type of road since no good quarries exist in the area.

VII. TECHNICAL ASSISTANCE WITHIN THE ROADS PORTION OF THE PROJECTS.

1) M. Le Carre's comments about the role of M-M in the projects are as follows:

- a) M-M's role in the project was not well defined at the project outset;
- b) The projects themselves are not well integrated into the OR operational activities;
- c) Internal conflicts have made M-M even more ineffective;
- d) Any technical assistance must be completely integrated into the OR chain of command;
- e) OR does need training technical assistance in their equipment maintenance operation and in their construction equipment operation, because they are understaffed and none of the local employees are well trained;
- f) OR does not need technical advice at a higher level;
- g) OR created a position for Loftin to intergrate him into the organization to carry instructions from the Zairian P.U. chief to the three separate road projects (the three project roads);
- h) Le Carre stated that M-M personnel are amateurs and have caused more harm than good. He would rather not have M-M on the project site at all but would be satisfied if all M-M team members were replaced by other M-M employees. He is aware of the complications involved with completely removing M-M.

2) Mr Loftin's description of the role of M-M in the projects is as follows:

a) Operator/Instructors have been specifically told by OR not to have anything to do with the technical aspects of road building.

b) Their function is limited to:

- (i) Making sure preventative maintenance of equipment is carried out properly and at the right time;

- (ii) Controlling the operators and drivers to prevent speeding, unauthorized vehicle usage and fuel theft; and
- (iii) Training the mechanics, operators and drivers though on the job training activities.

c) Mr Loftin's responsibilities include:

- (i) Overseeing the technique of road building;
- (ii) Maintaining an accounting of counterpart (TA) funds;
- (iii) Supervising the other TA team members;
- (iv) Formulating a formal training process;
- (v) Working with the soil technician;
- (vi) General administration in the form of quarterly report preparation.

3) Mr Loftin's reply to a request for clarification of item 2) c) i) above was that his contractual requirement made him responsible to Mr. Baudoin, the Président Délégué Général of OR, but that Mr. de Penfentenyo had been appointed as the liaison person for Mr. Baudoin. In reality, however, Mr. Loftin has tried to cooperate with M. Le Carre as much as possible. If he disagreed with M. Le Carre in technical matters, he would take them up with Mr. de Penfentenyo, but that case has never arisen. When asked if he had discussed USAID's memo of June 8, 1983 with either de Penfentenyo or Le Carre, Mr Loftin said the subject had never come up between himself and either of the other gentlemen.

4) On 20 June, 1983, OR requested authorization to use M-M as the single-source supplier of Technical Assistance for the work now to be funded under Loan 660-T-045, namely the eastern route of the "Maintenance Project", as revised to the Idiofa-- Ngenkong - Mangai - Ovekenenne - Panu routing. In anticipation of this request, USAID asked AID/Washington on June 10 to grant the required single-source waiver.

The reason for the request was that the original reconstruction work program for the Kikwit-Idiofa road called for a consulting engineering firm to provide 2 technicians for 36 months at a cost OR now calculates as \$864,000. OR states that the presence of another consulting engineering firm would complicate OR's operations in the area.

OR further indicated that they had considered the direct hiring of 2 technicians for 36 months at a cost of only \$360,000, but that this would involve recruitment problems and that it might be difficult to satisfy the conditions of AID's code 941.

OR proposes to have M-M extend the Technical Advisor/Team Leader's time by 15 months and supply another instructor for 36 months, thereby satisfying the technical assistance requirements indicated in the Project 660-0028 project paper for only \$590,000.

VIII. REPORTING PROCEDURES WITHIN THE ROADS PORTION OF THE PROJECTS.

1) The preliminary report indicates the work M-M proposes to do the project. A brief review of the inventory shows the differences between their proposed work and the original concept. There may be some difference in the exact stationing but at Km 0 both inventories are the same while the Lubue

river crossing is located at Km 79.1 in the original inventory and Km 79.5 in the M-M inventory. It is therefore safe to assume that locations between vary by less than 0.4 Km with the M-M inventory having the higher stationing.

Since no description is given in the M-M inventory for Km 1 but a description is given at the last km., the description can be assumed to be that of the previous kilometer, (or kilometers when a kilometer is omitted). The photos are taken looking ahead at each Km. but the description is of the road behind the photographer. Bearing this in mind two photos are cited below (a and b) for comparison of the inventories.

a) Km 40 photo - this area is identified as a problem area in the original inventory. The original text indicates that the requirement for widening the road to 10 meters between ditch inverts will require both the services of a front end loader and a bulldozer and that the brigade must move at least 120 meters a day to stay on schedule. The following is excerpted from the original inventory:

Km 39.0 - 39.4: 2.5 meter width, 3 meter cut face on right (side hill very steep on right but widening must take place into hill to remain in cut).

Km 39.4 - 40.6: 2.5 meter width, 2 meter high cut face on right.

The new inventory, which was taken when the photo was taken, states in part:

	<u>Height Shoulders</u>		<u>Width</u>	<u>Resurface</u>	<u>Estimated days for rehabilitation</u>
	<u>above road bed</u>				
	L	R.			
40	2.5	3.0	3.0	No	4
41	(not noted)				
42	0.5	0.5	3.0	Yes	7 (for 2 kilometers)

b) Km 52 photo - The original inventory says the width of the existing road is 6 meters between Kms. 51.4 and 52.3. The new inventory says the width back from both Km 52 and Km 53 is 2.5 meters.

2) The two quarterly reports, which are not formally numbered on the cover or within the lead off summary, contain the bare minimum of information. The first quarterly report indicates, under the first work task, R/W Clearing, that the actual work completed during the first quarter consisted of R/W clearing between Kms. 17 - 20, beginning in early March. The second report, under the same item, indicates R/W clearing beginning in mid February, and during the period February through June, credit is taken for clearing Kms. 0 - 19. In fact no additional clearing was evident up to Km 15 where the crew was working at evaluation time.

3) The M-M team leader indicated that OR was satisfied with these quarterly reports. The reports present detailed financial expenditures and budgeted amounts of the TA activities only, since these are the only expenditures for which he feels responsible. USAID is also interested in being able to

compare the proposed vs. the actual new equipment costs expended for the projects (see Annex R-4, project 660-026 and page 18, project 660-0028) and the overall expenditures proposed, and to date (see page 28, project 660-026 and Table 3, project 660-0028). Without this information it is impossible to determine from the Quarterly Reports how much money is left to spend and consequently whether or not the project will be completed within budget. (However, this information, for the US Dollar amount, is readily available in the USAID/Kinshasa office).

IX. CONCLUSIONS CONCERNING THE ROADS PORTION OF THE PROJECT.

- 1) The work completed to date on the Kikwit-Idiofa road is not in accordance with the work envisioned in the project paper.
- 2) Even if USAID were to waive the cross-sectional requirements for the Kikwit-Idiofa road the work done to date would have been mostly wasted, because the road will have to be entirely reshaped again once the culverts are installed, or the water will continue to flow across the road instead of flowing along the edge of the road to the culvert locations.
- 3) Therefore a great many resources have been used up on the first 15 km. of the Kikwit-Idiofa road in an attempt to make it passable for one rainy season. Both OR and M-M agree on the necessity for culverts in that section and both concur that the culverts must be installed before a second rainy season comes.
- 4) There are no calculations to prove that the sizes of the culverts ordered are correct or what the correct spacing of the culverts and miter drains should be to properly drain any section of the road.
- 5) The new institutional configuration of OR makes it impossible to structure the heavy brigade envisioned for the Kikwit-Idiofa road reconstruction project, since that Brigade was to be self-contained to the extent that it was to have its own quarters, soils crew, survey crew, and masons. The brigade crew consisted of 80 people plus advisors while the present crew includes only 44 people (plus administrative back up at the PU 250 level).
- 6) The present regional technical director's attitude towards the probable success of the reconstruction effort envisioned for the Kikwit-Idiofa road makes the likelihood of support of such an effort on the local level improbable.
- 7) The technical expertise for such a reconstruction program does not appear to exist currently within the Kwilu subregion, either within OR or the M-M team.
- 8) The current "brigade" and the second "brigade" (brigade being the common term being used to identify a group working together in one location) should be reassigned to work on the Kasai-Bulungu-Mosele II-Panu route until the problem of how to build the Kikwit-Idiofa route is resolved to everyone's satisfaction. As a result, no more resources will be expended improperly.

X. PROBABILITY OF COMPLETING THE ROADS PORTIONS OF THE PROJECTS WITHIN THE PRESENT FUNDING.

1. The data used to determine the amount (time) of work proposed on the modified 026 roads (the maintenance project, see section IV) is taken from the M-M inventory of those routes.

<u>Western "Maintenance" Route</u>	<u>Length</u>	<u>Workdays</u>
Route 1 (Kasai) to Bulungu	63.5	169.5*
Bulungu to Mosele II	108.5	293.5*
Mosele II to Panu	24.0	79.0
Sub-Total	<u>196.0</u>	<u>542.0*</u>
<u>Eastern "Maintenance" Route</u>		
Idiofa to Ngenkong	83.0	184.5
Ngenkong to Mangai	38.0	111.5
Mangai to Pio Pio River	22.0	63.0
Pio Pio River to Ovekenenne	22.0	68.5
Ovekenenne to Mosele II	<u>55.0</u>	<u>162.0</u>
Sub-Total	<u>220.0</u>	<u>589.5</u>
Total	416.0	1131.5

*These figures disagree with table 3-4 of the preliminary report. They were found by adding the working days shown in the inventories. (The subtotal is 3 days less than shown in the report).

The M-M preliminary report indicates 180 working days per year. The above table indicates the Western road averages 2.77 working days per kilometer so the Western road should require 3.01 years to complete. The Eastern road, according to the above table, averages 2.68 working days per kilometer so the Eastern road should require 3.28 years to complete. Both roads together require 6.29 crew years or, using two crews, 3.14 years to complete.

- The Project Paper assumed the Western route to be 196 Km and the Eastern route to be 146 Km in length. (Note that the originally inventoried eastern route was 160 Km in length). The project paper further assumed a production rate of 2 days per Km per crew and 192 work days per year. Therefore the project paper anticipated 342 (the project paper actually says 339) work days for both crews, or 684 total work days. While 342 days at 192 work days per year equals 1.78 years, the project paper assumed for funding purposes that the work would take 24 months to complete. Since M-M anticipates that nearly 3 years and 2 months will be required to do the maintenance work which was funded as a two year project, the gross assumption can be made that the zaire operational funding is only 64% of what is required, or that the zaire operational funding should be increased by 57%, not accounting for possible differences in crew make up and inflation. The dollar cost of spare parts will also increase.

2) The Technical Assistance costs are separately determined. The project paper indicated that 5 specialists would be provided for the work on the original 026 project. The total costs for 30 months for these 5 people were anticipated as \$665,000 and 2 450,000 with an approximately 5% contingency for inflation being added to the overall dollar costs. The contract between OR

and M-M for Technical Assistance calls for 3 advisors for 30 months with provision for an increase of an additional 6 months at the option of OR.

The Project Budget for these 3 technicians excluding the additional six month extension, which has not yet been granted formally, is \$990,723 and Z 1,601,465, or an increase of 42% above the original dollar estimate (including the contingency allotment) and an increase of 256% above the Z amount contained in the original Project Paper estimates.

As of 7/02/83 M-M had billed for \$239,675. This amount is more than the extra funding provided for the six month extension allowed under the contract. Even if M-M receives a six month extension, the longest they could stay and be funded would be less than 28 months more to complete their projected 38 month contract activities.

3) However the exercise of determining the US Dollar amount for Technical Assistance becomes more complicated because of the switching of route funding. 028 calls for 2 technicians for 3 years at a cost of \$675,000 and Z 907,000. A 15% contingency and inflation cost is included in the project dollar cost estimate. This increases the dollar value to \$776,000. By man-month, a crude measure at best, this amounts to \$10,800 and Z 12,600. The current M-M contract, executed over a year ago, amounts to a man-month cost of \$11,000 and Z 17,800. The current single-source waiver request suggests that the dollar costs for 51 more man-months of M-M Technical Assistance would amount to about \$590,000, or \$11,600 per man-month.

4. The switch of project routes has other implications. The completion time for the Kikwit-Idiofa road is estimated to be only 2.32 years rather than 3 years. Therefore the total time for all three projects becomes, by M-M count in the inventory:

Route	Work-days	Years	Months
<u>New Project 026</u>			
Western "Maintenance"	542.0	3.01	36
Kikwit-Idiofa	417.0	2.32	28
<u>New Project 028</u>			
Eastern "Maintenance"	589.5	3.28	39
			<u>103</u>

The current T/A contract for 026 calls for 90 man-months of work. The proposed OR single-source contract would add 15+36 = 51 man-months for 028 so that 141 man-months will be available. This would seem to be enough, including some extra for the time spent at the beginning. However consideration of the time frame in which things should happen shows a different picture.

The proposed schedule for 026 is as follows:

<u>Idiofa Brigade</u>		
Kikwit to Idiofa	2/83 to 6/85	28 months
Mosele II to Panu	7/85 to 11/85	5 months
<u>Bulungu Brigade</u>		
Route 1 to Mosele II	7/83* to 12/85	31 months

*This has already failed to occur.

If this is compared to the M-M T/A team availability we find the following time frame:

<u>Position</u>	<u>Arrival</u>	<u>Scheduled to leave</u> <u>Original</u>	<u>Proposed</u>	<u>Add six months</u> <u>extension</u>
Team Leader	11/1/82	4/30/85	7/31/86	1/31/87
Instructor 1	11/1/82	4/30/85		10/31/85
Instructor 2	11/1/82	4/30/85		10/31/85

Therefore, the two instructors are not funded for a long enough period to see the two brigades finish their work schedule even if the 6 month extension is added to their contracts and 028 never occurs.

USAID's best guess for arrival in country of the equipment for 028 is 12/84; yet the schedule, according to the M-M inventory, will require 39 months of work. Two possibilities occur:

Option A - new equipment does all the work:

"Eastern Maintenance" 12/84 - 2/88* 39 months

- *This date is beyond T/A funding currently being considered.

Option B - One additional brigade is added to the eastern route:

New Brigade 12/84 - 1/87 25.5 months

Idiofa Brigade 12/85 - 1/87 13.5 months

39.0 months

Under Option B the Team Leader would require the as yet unapproved 6 month extension and the third Instructor would come to Zaire 36 months before January 31, 1987 (i.e., on February 1, 1984). This would result in there being too many instructors on hand. Or he could come on May 1, 1985, permitting one instructor to leave on schedule and reducing the new instructor's time in country to 21 months for a total saving of 9 instructor months. However he and the team leader would have to run two dissimilar crews short-handed from Nov. 1, 1985 to January 31, 1987, a period of 15 months.

3. Both the options beg the basic question, however, of constructing the Kikwit-Idiofa road to the correct standard. Therefore other approaches should be investigated. One such approach could be as follows:

a) The first brigade can be transferred immediately to the Route 1 - Panu road where it will do the mechanical grading, watering and compacting it was originally supposed to do. It can be accompanied by one instructor operating in the role to which he has already been reduced; i.e., that of policeman/caretaker. He will keep all records and not offer any technical advice about road building. When the second brigade comes on stream, hopefully by January 1, 1984, it will join the first brigade. The two brigades will then leap frog their way towards Panu under the care of the single instructor, who will live in one of the project trailers now parked empty in Kikwit.

b) The two brigades, still adhering to the M-M time schedule, should reach Panu in 36 brigade months as follows:

Brigade I	10/1/83	-	4/15/85	19.5 months
Brigade II	1/1/84	-	4/15/85	16.5 months

4/30/85 is the end of the contract period for one instructor with no extension in time.

c) The brigades I and II could then turn around and leap frog towards Idiofa, an exercise that will require 39 brigade months, or 19.5 months each, according to the M-M inventory. If the presently vacant instructor position is not filled now, 20 man-months will be available for a new instructor, or the original instructor under an extension of his contract with M-M, to accompany the two brigades on this journey. This would allow completion of the second 30 month obligation, although probably at a slightly higher cost, without enforcing the extension provision.

d) The current team leader/technical advisor, super foreman position could be abolished leaving 18 man-months open in that position to be added to the additional 15 man-months OR has requested for a team leader. If three months of the team leader six-month time extension, which would have been required to fulfill the original M-M scheduling, are added, then 36 man-months for a highway engineer to build the Kikwit-Idiofa road properly would be available. The mechanic/equipment operator included in the single-source waiver request would be assigned to the Kikwit-Idiofa reconstruction as originally planned.

e) The above approach would save six months of instructor time extension for each of the two instructors and three months of time extension for the team leader over the M-M time allocations. This would allow the Kikwit-Idiofa route to be built as the prototype road proposed in the original 028 project paper.

4) Another possible approach for reducing Technical Assistance costs would be to turn the record keeping/policeman operation for the Kasai - Panu road and the Mosele II - Idiofa roads to Peace Corps volunteers. A volunteer could be assigned to each brigade and another assigned to coordination and report writing. Properly experienced PCVs could also fulfill the minimal training requirements for the two brigades. This would also eliminate the requirement for single-source supply for technical assistance for the Kikwit-Idiofa road.

XI. MAINTENANCE OF ROADS IN THE KWILU AREA

1) Under the equipment rehabilitation portion of the original 026 project four graders being repaired are for the project brigades. According to the second quarterly report nine dead-lined graders were scheduled for repair. Of these six graders are already back in service. This means that while only one brigade is working on the project four reconditioned graders are available for maintenance work. When two brigades are functioning and all nine graders have been reconditioned, five reconditioned graders will be available for maintenance work.

2) While graders alone do not represent maintenance capacity, they can serve as an indicator of potential capacity. OR could concentrate this capacity on their own maintenance of the Kikwit-Idiofa route until the proposed reconstruction can begin. This would permit the two brigades formed under the original 026 funding to work on the original 026 roads, removing AID's presence from a basically messy situation.

3) OR has shown little maintenance expertise in the past if the present state of the area roads is any indication.

4) The eastern and western routes will require one heavy grading per year in addition to the routine maintenance work to be done by the cantonniers after the project is completed. At a rate of 1.5 Km per day, this maintenance activity will require two graders full time. Assuming 100 to 150 vehicles per day will be using the Kikwit-Idiofa road, four graders will be required, with regrading occurring at six week intervals after project completion. After approximately 6 years, this route will probably require resurfacing. Since two more graders will be added to the fleet after completion at the Kikwit-Idiofa road, OR will have eleven graders available, of which six will be required for maintenance of the project roads.

5) It has been suggested that other organizations be considered for the maintenance of road sections in Kwilu. At least two major commercial organizations which currently maintain roads exist in the project area.

Plantations Lever au Zaire (PLZ), headquartered at Lusanga, currently maintains 171 Km of national roads under contract to OR, as well as 537 Km of secondary roads with its own funds. PLZ is also preparing to build a road near the western project road. M. Collard of PLZ indicated he would be willing to discuss the possibility of PLZ maintaining the Kikwit-Idiofa road.

Compagnie Commerciale du Bandundu (CCB), headquartered in Idiofa, maintains 425 Km of secondary roads in the Idiofa zone and 25 Km of national roads under contract to OR. The manager was not interviewed in Idiofa but CCB is also a possible candidate for road maintenance.

Firms such as Ets. Ele of Idiofa maintain secondary roads under contract to CODAIK. Ele has hired, equipped and supervised 41 cantonniers who maintain 121 Km of agricultural roads. While such small firms are capable of labor-intensive road maintenance they are probably too small and lack the managerial capability to handle equipment-based maintenance activities.

Developpement Progrés Populaire (DPP) is a non-profit missionary organization based in Idiofa which also has road maintenance experience. DPP built the farm-to-market bridges included in Project 026 (see section XII) under sub-contract to OR. The DPP Director was in Kinshasa when the evaluation team was in Idiofa so he could not be interviewed.

6) The use of any of the first three organizations for mechanized road maintenance incurs certain difficulties. The commercial enterprises may be biased towards maintenance of road sections most useful to their own purposes. This suggests DPP as the most likely candidate for further

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investigation. However if any of the three organizations were selected they would need equipment operators trained in road maintenance work as well as the mechanized equipment to do the work. The obvious solution would be to provide them with the equipment purchased or rebuilt for the projects.

Such a solution would probably meet with objections from Office des Routes, at least at the regional level. Even if such an equipment transfer could be arranged, there would still be a question of financing fuel and spare parts (although OR might be able to supply these).

The further investigation of any such reallocation of maintenance activities must also address the institutional configuration of OR and the political implications as seen by both local and central government officials.

7) In spite of the difficulties outlined above, the AID investment in these project roads would be more secure if their maintenance were not left solely to OR with its present capabilities in the Kwilu area.

XII. STATUS OF THE BRIDGE PORTION OF PROJECT 026

1) Sixteen bridges have been built by the "Developpement Progrés Populaire (DPP)" which is an agro-industrial and construction enterprise created and operated by the Catholic Church. The bridges were built under a subcontract between DPP and OR using AID counterpart funds. No formal reports about the completion of these bridges have been submitted to AID by OR.

2) The bridges include:

Intshwem II	6.45 meters
Banda	4.00 meters
Lwende III	4.00 meters
Mukombe	13.00 meters
Gombe I	28.00 meters
Gombe II	7.50 meters
Iniendongo	12.00 meters
Ngoso	6.70 meters
Mpul	8.70 meters
Melundu I	26.00 meters
Melundu II	8.10 meters
Ntsong	6.10 meters
Mutoy	6.20 meters
Iyene	25.00 meters
Impasi	13.00 meters
Ekubi	<u>Abutments for a Baily bridge</u>

Total Length 174.75 meters

3) The bridge construction consists of a reinforced concrete slab on two reinforced concrete girders tied into rock masonry abutments by reinforcing

bars. The longer bridges also have rock masonry intermediate piers. The slabs are 10cm thick and have an overall width of 3.40 meters. Concrete wheel guards are included as an intergral part of the bridge deck. They are 20 cm high with a top width of 10 cm and a base of 15 cm, thereby reducing the deck roadway width to 3.10 meters. The reinforced concrete girders are 40 cm wide spaced 1.80 meters apart on centers. Two sets of plans are available which indicate the depths of the girders and the reinforcing steel placement, and the thickness of the rock masonry abutments. The girder depths are somewhat inconsistent when compared. See table below:

<u>Plan 1 - odd length spans</u>			<u>Plan 2 - even length spans</u>		
<u>Span length</u>	<u>Abutment thickness</u>	<u>Girder depth</u>	<u>Span length</u>	<u>Abutment thickness</u>	<u>Girder depth</u>
3m	40cm	25cm	4m	40cm	35cm
5m	40cm	40cm	6m	50cm	55cm
7m	50cm	50cm	8m	50cm	55cm
9m	60cm	70cm	10m	60cm	80cm

No plans were available for spans greater than 10 meters, but the bridge at Impasi Mbulu Village had a span of 13 meters and the bottom of the girders had an arch configuration.

4) AID engineer Mulamba wa Kabasele prepared a report reviewing the bridge construction on March 17, 1983 in which he correctly identified the monolithic nature of the bridge design as creating an indeterminate structure. This has caused cracking in several of the rock masonry abutments. We were shown a new bridge deck plan at DPP headquarters in Idiofa which attempts to rectify this problem by placing the two ends of the bridge beams on the top of the abutments with no physical connection. The bridge then becomes a simple structure (vs an indeterminate structure) and the abutments are in compression. However the deck girders should be pinned on one end to prevent lateral movement if a dead tree floating down stream should snag against the bridge girders. Impasi bridge is founded on rocks placed in the river. Considering the river current even at its present low stage, this is not the safest method of founding abutments.

5) DPP is not currently building any bridges using AID counterpart funds. They are waiting for a new sub-contract to be submitted by OR to USAID for approval.

XIII. STATUS OF PORT IMPROVEMENTS PORTION OF PROJECT 026

1) The improvements of DIBAYA-LUBWE and PANU ports have not begun due to difficulties in selecting a design engineer. The currently available plans were lacking enough detail to evaluate their engineering merit. However, an examination of the sites for port improvements prompts the following comments:

a) The designer of DIBAYA-LUBWE port should consider the possibility of placing steps flanked by concrete drainage channels or half sections of metal culvert pipe drainage channels rather than making a ramp with a 25% gradient to determine if such a solution might be cheaper and less likely to erode.

b) Erosion is a very serious problem at PANU port. Not only is the base of the river bank being eroded by the river during high water but also the top of the bank is being eroded by surface runoff. This combination of erosive forces is causing the migration of the river bank top towards the town of at least one meter per year measuring from a property marker shown on the site plan. Without a valid solution to the erosion problems the proposed bridge-ramp may end up completely surrounded by water during river flood stages in a relatively short period of time.

2) - The ports have been designated official ONATRA ports as required in the project paper and ONATRA owns the land on which the proposed improvements will take place.

XIV. STATUS OF THE BARGE IMPROVEMENTS PORTION OF PROJECT 026

- 1) Four barges and one tug boat (pusher) which were out of service were repaired by Chanimetal (a local marine engineering and construction firm) and placed back in service in 1980-81 by ONATRA.
- 2) USAID personnel inspected the work in June of 1982 and approved payment. This portion of the project has therefore been completed.

XV. RECOMMENDATIONS

- 1) The mechanized unit now working on the Kikwit-Idiofa road should be moved to the Kasai - Bulungu - Mosele II - Panu road.
- 2) The Kasai-Panu road should be improved to a "good earth road" standard by mechanized shaping, watering, and compaction. The installation of the 160 culverts and one bridge recommended in the Morrison-Maierle Inc. inventory should not be included as a task for USAID financed mechanized units.
- 3) The second mechanized unit to be formed under the original 026 funding should also work on the Kasai-Panu road, both units remaining in close proximity to the other so that the necessary technical assistance can be provided by a single instructor/operator/mechanic.
- 4) The equipment rehabilitation portion of project 026 should continue with OR taking responsibility for proper accounting for spare parts receipt and use to USAID.
- 5) The two mechanized units funded by AID under 026, still working in close proximity to each other, should after finishing the Kasai-Panu road proceed to improve the Mosele II - Ovekenenne - Pio Pio - Mangai - Ngenkong - Idiofa road to a "good earth road" standard by mechanized shaping, watering, and compaction. The installation of 20 culverts and one bridge recommended in the Morrison-Maierle, Inc. inventory should not be included as a task for these USAID financed units.
- 6) The Technical Assistance (TA) supplied by Morrison-Maierle Inc. should consist of one instructor/operator/mechanic to travel with the two mechanized

units. This individual can be one person who stays for the whole time or one person who works the Kasai-Panu road and another person who subsequently works the Mosele II - Idiofa route. In either case, the 60 man-months of instructor/operator/mechanic time included in the T/A contract for 026 should be expended in the completion of those two roads.

7) USAID should insist that GOZ honor their agreement to build the Kikwit-Idiofa road as the prototype road envisioned in the project paper. The brigade so formed should be separately headquartered and self-sufficient. The Engineer/Construction Superintendent must have technical control over the brigade's operation to ensure proper construction of the prototype road.

8) USAID should relocate the feeder-road activity back to the area adjacent to the Kikwit-Idiofa road.

9) The current position of Team Leader/Technical Advisor should be eliminated in the Technical Assistance currently being provided by Morrison-Maierle, Inc. and the present incumbent should be removed from the project. The remaining man-months for that position should be combined with the man-months for team leader position included in the OR request for Morrison-Maierle Inc. as single-source supplier of Technical Assistance for 028 funding. The combined funding for the Team Leader position should be used towards the provision of an Engineer/Construction Superintendent/Team Leader for the full three year construction period of the prototype road between Kikwit and Idiofa. The funding for the additional three years of Technical Assistance included in OR's single-source request should be expended on a Master Mechanic for the prototype road brigade.

10) USAID should ignore all references to the use of a non-degreed engineer which appear in the Technical Report - Road Upgrading Operations report prepared for project 028.

11) USAID should insist on receiving quarterly reports which provide enough information to allow USAID to monitor the projects' activities. Annex A, Quarterly Report content, is attached to this report to indicate the types of information which should be included in a quarterly report for monitoring purposes.

12. USAID should not permit the further expenditure of counterpart funding for farm to market bridges until satisfactory bridge construction plans are approved by USAID. When further bridge construction is authorized, the USAID mission engineer should spend two weeks with the DPP construction crew to determine if their quality control procedures and construction methods are acceptable, and to introduce rudimentary reporting procedures.

13. USAID administrators should make full use of their in-house engineering capability and the back-up engineering capability available from REJCSO/Abidjan as well as consulting engineering services as appropriate, in contrast with project contracted engineering services, before making further engineering-related decisions pertaining to road construction, bridge construction, and the anticipated port construction.

14. USAID should insist that all equipment and material purchased for the exclusive use of the technical assistance portion of the 026 project and not now required for the reduced technical assistance effort on the Kasai-Panu and Mosele II-Idiofa roads be held in reserve for the technical assistance effort to be provided under the 026 project funding.

15) USAID should open discussions with the GOZ about the countrywide problem of earth and granular surfaced road maintenance. The ultimate objective of such discussions should be a better solution to the maintenance requirements of the project roads. Without such a solution the benefits derived from these projects will be short-term.

ANNEX A. QUARTERLY REPORT CONTENT

1) Project agreements usually indicate that the host government will maintain or cause to be maintained (by the consultant), in accordance with generally accepted accounting principles and practices consistently applied, books and records relating to the project, adequate to show, without limitation, the receipt and use of goods and services acquired. Quarterly reports are usually the vehicle used to present this accounting to the funding agency.

2) If these quarterly reports are to be meaningful, they should be timely, correct, and supply all the data necessary to account for the supplies and activities on the project. The format should be such that it shows, in tabular form, budgeted amounts, total project expenditures at the beginning of the quarter, expenditures during the quarter, and total project expenditures at the end of the quarter, all by line items. This format allows quick comparison of overall budget and total expenditures, the current activity among accounts, and allows mathematical accuracy to be checked.

3) Questions which should be answered within the quarterly report text include, but are not limited to, the following:

a) For each road, or road section:

When did construction begin?

How long did it take?

How many days were lost and why?

How many culverts were installed?

What size were they?

How much material was hauled?

How many quarries were opened?

What was the average haul distance?

How many equipment days were involved?

Has construction of the section been completed?

What is the estimated cost of construction to date?

Was the production target met; if not, why not?

b) For materials:

How much has been ordered?

How much has been received?

How much has been used?

Where? (should be answered in a) above)

How much is on hand?

How much does a unit cost?

c) For people:

How many people were employed, by job classification, at the beginning and end of the quarter?

Why did the number change?

How were the work task crews made up?

What middle-management positions were in charge of which crews?

What is the authorized number of employees?

Are any of the consultant employees' contracts due to expire before the project is finished?

What is being done to replace them?

What is the home leave schedule of the consultant's employees?

How will the job continue during such absences?

4) While the above questions do not exhaust the list by any means, they represent data that describe to the government and funding agency how and where the money is being spent and give some indication of the planning process being followed. Proper planning and record keeping are obviously the keys to efficient Quarterly Report preparation as well as to the efficient execution of the project.

SECTION 3: EVALUATION OF TRAINING COMPONENTS

A. Training for the Road Transport Subproject, Agriculture Marketing Development Project 660-T-026

1. Introduction

On August 17-19, 1983 a visit to Kikwit was organized to evaluate the in-service training programs for operators and mechanics of Office des Routes Unité de Production 250, which is responsible for the implementation of the road subproject. Interviews were conducted with road engineers Lloyd Crowther, consultant, and Mulamba wa Kabasele, USAID/DEO; John Loftin, Morrison-Maierle (M-M) team leader; Leo Malenfant, M-M mechanics instructor; Professor Kimenga Masoka, OR Training Director; Yves Gatty, Office des Routes (OR) SGMTP/Kikwit chief mechanic; Cit. Katshwe, chef de chantier, OR; and various equipment operators and mechanics. Moreover, visits were paid to the work site, the borrow pit, SGMTP/Kikwit, and the OR Offices. Two quarterly progress reports from M-M, and various USAID reports were also consulted.

2. Recommendations

From a review of the project's progress to date, five recommendations emerge. First, on-the-job operational training of the work crew operators and mechanics should be suspended; instead the M-M mechanics instructor ought to concentrate on establishing an operator/mechanics dialogue to facilitate the working of the crew as an integrated team. Second, the operator/road construction section of the OR training programs should be modified to include training in the use of the equipment in actual road construction techniques; that is, a graduating operator should be capable of executing the different road building steps with the proper equipment. Third, training should be provided at the project management level to help establish a workable project team; this would include organizational development, the setting up of clear communication lines, and the acquisition of skills for working in groups. Fourth, Zairian counterpart staff should be identified and assigned as soon as possible at all levels of project management; moreover, a formal training program should be prepared that would give the counterpart staff the necessary foundation for them eventually to assume full responsibility for their positions.

And finally, to the extent possible the equipment park should be streamlined; this should include limiting the equipment to a single manufacturer for each work site, and to a single model for each item of functional equipment; this should greatly simplify the operation, maintenance of, and training on the equipment, and the management of and investment in spare parts.

3. Findings

a) On-site observation of the operations of a front-end loader and some dump trucks revealed good operator skills. The mechanics instructor and the chef de chantier claimed that the operators on this and the other work-site equipment were equally proficient. This proficiency, however, is limited to the handling of the equipment. The operators do not appear to be trained in road construction techniques and in the use of their equipment for that purpose. This

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may point to a weakness in the OR training program currently conducted at the three regional OR training centers. In the view of the project and the SGMTP/Kikwit mechanics the skill level of the mechanics attending to the project equipment was acceptable for light maintenance. Direct and constant supervision, however, is required to ensure that the work is done. The instructor and crew chief also felt that a mutual understanding of the operators' and mechanics' respective functions might help reduce the need for maintenance and increase the efficiency in the utilization of the equipment. OR plans to open its own operator and mechanic training facility in Kikwit later this year. It may be possible to send project staff to refresher courses at that facility in case of need; the Kikwit center will also turn out graduates who will form a resource pool to tap in the future.

b) Discussions with the project management team on the project organization structure and reporting responsibilities showed that the authority, responsibility and communication lines were ambiguous. It is apparent that no clear understanding exists as to the way the work needs to be done, with each member of the team having a somewhat different view of his role, his contribution to the project, his decision-making power, and of the technical concepts of the project. There seems to be no acceptance of a recognized team leader; a team spirit in the group is lacking, and at times various members appear to be working at crosspurposes.

c) Institutionalization of road maintenance capacity is synonymous with Zairianization of the project. To date, Zairian counterpart staff have not yet been identified, although qualified and, by their own account, underemployed Zairians are to be found at the SGMTP center in Kikwit, and in other OR Offices. Following their eventual recruitment, an elaborate training program should be established that would spell out specific activities, tasks and steps the technical assistant would carry out jointly with his counterpart to ensure a smooth and effective transition of responsibility during a predetermined period.

d) A review of the on-site equipment list shows within the same park two manufacturers and four models of graders, two makers of dump trucks and two makers of compactors. Such diversity is bound to complicate the operation and maintenance of the equipment, and to increase the spare parts inventory costs.

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B. Regional Training Center, Lubumbashi, Agricultural Marketing Development
Project 660-0028

1. Introduction

A visit to Lubumbashi was organized on September 5-8, 1983 to evaluate the Regional Training Center (CFR) of the Office des Routes (OR) in Lubumbashi. Interviews were held with Professor Kimenga, Director of Training, OR; Mr. Alain Girard, CFR Director; Mr. Salvatore Russo, mechanic instructor, CFR; Cit. Tshitenda, Technical Assistant to the CFR director; and Cit. Lelo, Regional Director, OR. Moreover, the physical infrastructure was inspected, and operator and mechanics classes were attended. One semi-annual and two quarterly progress reports from the CFR and various OR reports were also consulted.

2. Recommendations

The project seems off to a very good start, and promises to be a success. Three recommendations have emerged from a review of progress to date. First, OR should identify and recruit immediately Zairian counterpart staff to replace the three expatriates upon their departure in 18 months. Second, detailed training and transition programs should be designed and implemented that would prepare these counterparts eventually to assume full responsibility for their positions. And finally, the CFR Director should devote more time and energy to the implementation of the training programs while vigorously applying admission standards and course prerequisites.

3. Findings

USAID funding of the project in the amount of \$ 648,411 provides for the financing over a 24-month period of three technical advisors: the CFR Director, and the mechanics and operating instructors. Although the Project Loan Agreement was signed in September 1981, the contract between ORT and OR was not signed until March 1983. The CFR Director joined the project in November 1982, the mechanics instructor in May 1983, and the operator instructor will come on board in October 1983, thus completing the technical assistance team. The first training seminar was conducted in January 1983; to date 69 OR trainees have attended some seven seminars, with 54 obtaining a certificate of completion; the remaining 15 received only an attestation of participation for lack of having met the rigorous standards set for successful completion.

The project paper calls for 250 participants to be trained in each of the two years of the project life. It is difficult to ascertain whether or not this quantitative target will be met in light of the OR needs assessment process. The regional OR staff meet once every quarter to formulate a quarterly work program covering all aspects of road maintenance for the region, including the identification of personnel that need to be trained. Personnel will be trained subsequently at the CFR if they meet the admission criteria and if the number of applicants falls within the bracket of acceptable class size.

The buildings are provided by the GOZ and house nine offices and a conference room; three classrooms; two apartments/studios; a dormitory comprised of 15 rooms and 60 beds; a meeting room, restaurant and kitchen facility; four storage rooms; one workshop with adjacent tool room; one welding shop; one carpentry shop; one car wash; and a recreation room. The structures are well designed and built, modern, clean and functional.

Tools are excellent and in ample supply; their use and storage is well organized and controlled. Road building equipment, however, is still incomplete, and spare parts are in short supply. The CFR enjoys an excellent cooperation with and support from the OR regional office as regards access to OR spares inventory. Several items of equipment have been refurbished already or rebuilt by the trainees as part of their curriculum.

The CFR director appears to run the compound with an iron hand, reflecting his military training. To a certain extent he seems to emphasize the physical infrastructure to the neglect of training, as evidenced by the ratio of offices to classrooms, the allocation of time touring the compound, and his own orientation.

Within the training program, operator and mechanics classes are favored over road construction classes. The training material consists of standard OR manuals and course content already employed at OR's Kasangulu center, which has been in operation since 1980. 1/

The material itself was not reviewed. All OR training seminars set certain admission criteria which the prospective trainee must meet to attend a seminar. In Lubumbashi there was evidence that these criteria had been relaxed somewhat for the seminars in progress at the time of the visit. The project, however, could benefit from teaching aids such as slide projectors and slides, overhead projectors, poster-size drawings and models; it is not known to what extent such material exists in the other CFRs.

The entire management staff seems dynamic, able and willing to make a go of the CFR. The development of the human infrastructure, however, raises some concern. While the CFR director is assisted by two deputies, from which one will be chosen at the end of the CFR director's term to succeed him, the two other technical assistance positions are still without their homologues. No training program exists currently to groom the counterpart staff for the functions they will assume upon the departure of the expatriates, presently scheduled in about 18 months. Nor have transition programs been elaborated that would give the homologues initially short, and later increasingly longer, opportunities at exercising the responsibilities of the job they are to assume.

1/ Most OR CFRs deal with the same equipment, which facilitates the use of the same training material. The Lubumbashi CFR, however, is the only center having Clark tractors, for which all manuals were developed at the CFR.