

1. PROJECT TITLE
PVO Economic Support Project

2. PROJECT NUMBER
660-0097

3. MISSION/AID/W OFFICE
Zaire

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) 87/05

REGULAR EVALUATION **SPECIAL EVALUATION**

5. KEY PROJECT IMPLEMENTATION DATES

A. First PRO-AG or Equivalent PY <u>83</u>	B. Final Obligation Expected FY <u>83</u>	C. Final Input Delivery PY <u>87</u>
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6. ESTIMATED PROJECT FUNDING

A. Total	\$ <u>7,300,000</u>
B. U.S.	\$ <u>5,000,000</u>

7. PERIOD COVERED BY EVALUATION

From (month/yr.) 06/85
To (month/yr.) 05/87
Date of Evaluation Review 05/87

8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR

A. List decisions and/or unresolved issues; also those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., telegram, SPAR, PIO, which will present detailed request.)

A. ACTION DECISIONS	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED
1. ORT will prepare two sets of basic project and subproject documents to be transferred to USAID at PACD.	ORT	09/30/87
2. ORT project manager will convene and chair a joint meeting of CECA sub-project personnel and Kwandruma community members to discuss future management of Koda hydro facility.	ORT	06/30/87
3. A general manager will be selected to replace the current Koda hydro manager.	ORT/CECA	06/15/87
4. USAID, ORT, and CECA will determine the means by which the Koda manager position will eventually be Zairianized.	USAID/ORT/CECA	09/30/87
5. ORT will request a comprehensive training plan from CECA for locally hired personnel.	ORT	06/15/87
6. ORT will write an official letter to CECA reiterating the condition precedent (E-3) in the sub-grant agreement concerning Kwandruma's role in managing the hydro facility.	ORT	06/15/87

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS

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

10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT

A. Continue Project Without Change

B. Change Project Design and/or Change Implementation Plan

C. Discontinue Project

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

Gary A. Walker, Team Leader
William Baron, Civil Engineer
Ross Turner, Electrical Engineer
Dr. Ngay Aben, Management Training Specialist
Kate Newman, Project Officer, USAID

12. Mission/AID/W Office Director Approval

Signature: *Dennis Chandler*
Typed Name: Dennis Chandler, Mission Director
Date: 5 JUNE 1987

PROJECT EVALUATION SUMMARY (PES) - PART I

Report Symbol U-44

1. PROJECT TITLE PVO Economic Support Project	2. PROJECT NUMBER	3. MISSION/AID/W OFFICE
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)		

5. KEY PROJECT IMPLEMENTATION DATES			6. ESTIMATED PROJECT FUNDING	7. PERIOD COVERED BY EVALUATION
A. First PRO-AG or Equivalent FY _____	B. Final Obligation Expected FY _____	C. Final Input Delivery FY _____	A. Total \$ _____	From (month/yr.) _____
			B. U.S. \$ _____	To (month/yr.) _____

8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR

A. List decisions and/or unresolved issues; cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., diagram, SPAR, PIC, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED
7. ORT will review proposed rate structure to ensure affordability.	ORT	08/15/87
8. Draft chart of accounts will be reviewed by a chartered accountant for completeness, logic, and internal consistency.	ORT	08/15/87
9. 097 Project Committee will meet to decide how best to ensure completion of the hydro facility.	USAID	06/01/87
10. A final technical evaluation will be conducted after electricity has begun to flow at hydro facility.	USAID	TBD
11. Short-term management assistance will be provided to DPP through the PACD.	USAID	09/30/87
12. "As-built" drawings will be made after construction is completed by ACEC and BETEC of the entire facility taking into account all design and construction changes. One complete set will be given to the USAID/Kinshasa's engineering office, and one complete set to CECA. The "as-builts" will be made available by the contractor prior to disbursement of funds for the final payment.	USAID	12/31/87

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS

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

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12. Mission/AID/W Office Director Approval

Signature _____

Typed Name _____

Date _____

2

PROJECT EVALUATION SUMMARY (PES) - PART I

Report Symbol U.S.

1. PROJECT TITLE PVO Economic Support Project		2. PROJECT NUMBER _____	3. MISSION/AID/W OFFICE _____
4. EVALUATION NUMBER (Enter the number maintained by the reporting unit e.g., Country or AID/W Administrative Code, Fiscal Year, Serial No. beginning with No. 1 each FY)			<input type="checkbox"/> REGULAR EVALUATION <input type="checkbox"/> SPECIAL EVALUATION
5. KEY PROJECT IMPLEMENTATION DATES		6. ESTIMATED PROJECT FUNDING	
A. First PRO-AG or Equivalent FY _____	B. Final Obligation Expected FY _____	C. Final Input Delivery FY _____	A. Total \$ _____ B. U.S. \$ _____
7. PERIOD COVERED BY EVALUATION			Date of Evaluation Review _____

8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR		
A. List decisions and/or unresolved issues; also those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., diagram, SPAR, PIC, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED
13. The construction contractor, D.V.V., will provide to its workers all safety equipment, drinking water, etc. as listed in Annex 1 of this report.	ORT	06/15/87
14. A ladder will be installed on the inside left wing wall of the dam near the clean out opening. (For safety reasons if a person accidentally falls into the pool).	ORT	09/30/87
15. Outdoor security lighting will be installed for hydro plant, stairway, substation and penstock areas.	ORT	09/30/87
16. Technical assistance will be provided for start-up and testing of turbine-generator equipment.	ORT	09/30/87
17. Testing equipment (such as a DC Hypot/thumper) unit will be provided for use at Koda.	ORT	09/30/87
18. A mechanism for continual technical review and training will be established.	ORT	09/30/87

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS	10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT
<input type="checkbox"/> Project Paper <input type="checkbox"/> Implementation Plan (w/ CPI Network) <input type="checkbox"/> Other (Specify) _____ <input type="checkbox"/> Financial Plan <input type="checkbox"/> PID/T <input type="checkbox"/> Logical Framework <input type="checkbox"/> PID/C <input type="checkbox"/> Other (Specify) _____ <input type="checkbox"/> Project Agreement <input type="checkbox"/> PKD/P	A. <input type="checkbox"/> Continue Project Without Change B. <input type="checkbox"/> Change Project Design and/or <input 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
	Signature _____ Typed Name _____ Date _____

PROJECT EVALUATION SUMMARY (PES) - PART I

1. PROJECT TITLE Report Symbol U

PVO Economic Support Project

2. PROJECT NUMBER _____ **3. MISSION/AID/W OFFICE** _____

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B. U.S. \$ _____	From (month/yr.) _____
	To (month/yr.) _____

Date of Evaluation Review _____

8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR

A. List decisions and/or unresolved issues; also those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., program, SPAR, PIQ, which will present detailed request.)

B. NAME OF OFFICER RESPONSIBLE FOR ACTION **C. DATE ACTION TO BE COMPLETED**

19. Training will be provided to maintenance personnel to ensure proper repair and maintenance procedures are followed. (See Engineering recommendations 20-25).	ORT	09/30/87
20. Results of compression tasks done on concrete used for abutments will be verified by an independent laboratory.	ORT	06/30/87
21. Concrete strength of all abutments will be tested (with Schmidhammer) by an independent laboratory.	ORT	06/30/87
22. DPP will replace existing steel culverts at Munga site with one concrete culvert.	USAID	09/30/87
23. The material used for the approaches will be replaced/strengthened at all bridge sites.	USAID	09/30/87
24. White stripes will be painted with reflecting paint on each end piece, on all bridges.	ORT	09/30/87
25. Warning signs will be posted at least 300 meters before each bridge site.	ORT	09/30/87

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS

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

10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT

- A. Continue Project Without Change
- B. Change Project Design and/or Change Implementation Plan
- C. Discontinue Project

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

12. Mission/AID/W Office Director Approval

Signature _____

Typed Name _____

Date _____

MISSION COMMENTS ON RECOMMENDATIONS NOT ON THE PES

1. Recommendation 2 from the Executive Summary (ES), is a general suggestion for the Mission, thus, will be taken into consideration in future Cooperative Agreements.
 - "(2) It is recommended that USAID include in future cooperative agreements precise information regarding the institutional contractor's responsibilities in the area of exonerations, shipping, permissible housing styles, etc.."
2. Recommendations 3 through 8 from the FS, are suggestions for SANRU and other health activities, and have been forwarded to PHO for review.
 - "(3) It is recommended that since ECZORT's commodity distribution was successful, a similar approach should be considered by SANRU II."
 - "(4) It is recommended that since ORT has been comparatively more efficient in procuring commodities for SANRU than USAID, ORT might be considered for the procurement of commodities in the future for SANRU II if this is feasible."
 - "(5) It is recommended that for future health activities more emphasis should be laid on quality control: (1) prior to assisting health zones, their needs should be assessed so as to respond more to the individual needs; (2) more financial supervision should be scheduled."
 - "(6) It is recommended that SANRU consider employing a construction technician in Kinshasa to act as a "circuit rider" to teach brief seminars in practical masonry, carpentry and other basic skills in villages. Two or three villagers could be chosen for this training and would receive certificates. One would be named the village work foreman charged with improving local workmanship."
 - "(7) It is recommended that institution building should continue to be stressed as an important component of SANRU II. Among the actions that should be taken are: (1) ensuring higher quality health personnel training; (2) developing and promoting training materials; (3) when long term expatriate technical assistance is used, a Zairian should be associated to ensure transfer of technical know-how."
 - "(8) It is recommended that further assistance should concentrate on health centers where the need is greatest and focus more on mini integrated self-help projects. Experiences like the Loko health center in Equateur and that of D.P.P. in Bandundu should be examined to integrate health and small economic activities."
3. Recommendation 9 from the ES, will be considered during the design of the follow-on PVO project.
 - "(9) It is recommended that future PVO assistance projects in Zaire be designed to permit reasonable overhead costs to be billed by local PVOs once they are determined and verified by generally accepted accounting principles. They may be part of a local PVO project contribution but should be shown as such in writing and in detail."

4. Recommendation 12 from the ES, will be addressed by the 102 Project Officer.

"(12) In view of the impending start up of USAID project 102, the project should give full consideration to DPP's request for a long term agricultural extension trainer, examine the role of women in all aspects of project design and consider whether a discrete component for women would be appropriate."

5. Recommendation 18 from the ES, is unfortunately beyond the reach of USAID's influence. The sub-project management will be informed of these concerns.

"(18) It is recommended that AID investigate whether there is a means to hold sub-grantees to the same requirements as grantees with respect to the prohibition on all forms of employment discrimination (race, gender, religion, etc.). USAID and ORT should write to CECA encouraging them to reconsider their position restricting employment on the project to Christian Protestants and adopt a statement in its articles of incorporation or by-laws for the Koda hydro facility guaranteeing that the principle of equal employment opportunity based solely on merit will be observed."

6. Recommendations 19 and 20 from the ES, have already been implemented.

"(19) It is recommended that ORT and after the PACD USAID maintain close scrutiny of work conditions at the sub-project site. If work conditions are not corrected within fourteen days, the Mission recommends issuing a stop work order to prevent possible injury and/or death to laborers on a U.S. government funded project."

"(20) It is recommended that ORT write an official letter to CECA (copy to USAID) reiterating the Condition Precedent (E.3) in the sub-grant agreement mandating USAID/ORT agreement with the eventual management design and urging a substantial role for Kwadruma in whatever organizational framework is eventually agreed upon by the concerned parties for management of the facility."

7. Recommendation 25 from the ES, , will be completed before the end of FY87.

"(25) It is recommended that USAID undertake as planned a mini hydro scheme research and evaluation study to obtain comparative cost estimates, comparative data on the distribution of benefits, comparative assessments of user fees and long term financial viability data. in the scope of work for the study aid should specify its goals for hydro facilities with emphasis on how it views the relative importance of aiding Zairians directly, aiding Zairians indirectly through support of mission run public facilities (hospitals) and assisting missionaries directly with their electric needs."

XD-AAW-368-A
32315

FINAL EVALUATION REPORT

Project Title: "Project Management of Private Voluntary Organization (PVO)
Economic Support"

Project Number: 660-0097

Submitted to:

U.S. Agency for International Development

Submitted by:

Gary A. Walker, Team Leader
Ngay Aben, Management & Training Specialist
William Baron, Civil Engineer
Ross Turner, Electrical Engineer

May 12, 1987

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EXECUTIVE SUMMARY

I. PROJECT TITLE

Project Management of Private Voluntary Organization (PVO) Economic Support (CA No. AFR-0097-A-00-3072-00)

II. PROJECT DESCRIPTION

Project 097's stated purpose is to "support self-sufficiency in basic foods and access to basic health services for the rural population." The project objectives are: (1) management and allocation of a central umbrella fund to support project activities; (2) upgrading indigenous PVOs as viable development agencies and (3) implementation of PVO sub-projects that conform to GOZ/USAID development strategy. Constraints addressed by the project are poor farm-to-market feeder roads and transport blockages caused by too few bridges in Bandundu region, insufficient supplies of basic medical equipment and drugs at rural health clinics throughout Zaire, and the high cost of diesel-generated electricity at the Rethy mission station and unavailability of electricity in neighboring Zairian villages. The outputs of project 097 through its three sub-projects include: rehabilitation of 220 rural clinics; procurement and delivery of \$880,000 worth of drugs and medical equipment; installation of \$314,000 worth of solar electric equipment at rural clinics; training for over 125 doctors, administrators and pharmacists in rural health system management; construction of nine bridges, installation of 164 culverts and training of 23 associated staff in management; partial completion of a mini-hydroelectric facility and U.S. training for the sub-project manager.

III. EVALUATION PURPOSE

This is the Final Evaluation of 097. Its purpose is to assess overall project performance, to review project design to determine its appropriateness and replicability for future PVO assistance efforts, to review the effort in each sub-project to achieve self-sustaining development through application of user fees and institutional strengthening, and to make recommendations to assist in the timely completion of remaining project activities. Finally, the Evaluation Mission has made a number of recommendations concerning the purpose and design of future PVO support projects.

IV. EVALUATION METHODOLOGY

The evaluators interviewed USAID and project personnel, interviewed intended beneficiaries, reviewed project documentation and correspondence and visited project sites in the Idiofa and Kajiji areas of Bandundu, in the Kimpese and Mbanza Ngungu areas of Bas Zaire and in the Rethy area of Haut Zaire.

V. FINDINGS

Since signing the Cooperative Agreement on September 30, 1983, the project has successfully achieved the majority of its objectives. Of nine planned bridges, seven are completed and the other two will be complete before the PACD. The project also provided major institution building interventions with the cooperating Zairian PVO in Bandundu region in institutional reorganization, management and financial systems training and technical training. Rural health inputs have complemented and reinforced the work of USAID's major health

project (SANRU) both through the provision of commodities and by strengthening administrative and financial management. The installation of solar electric systems has made it possible to protect the vital cold chain for vaccines and has saved lives by providing emergency backup power for hospital operating rooms and to power oxygen supplies.

The mini-hydroelectric facility is 65% complete as of April 30, 1987 and the two engineers on the evaluation team estimate completion and project start up by early November, 1987. In view of serious delays caused by bankruptcy of one of the contracting firms in the contractor Association responsible for building the facility and concerns about the inadequate involvement of Zairians in the development and eventual management of the system, the evaluators recommend extending O97 to December 31, 1987 to assure continued close supervision of project activities.

The evaluators also urge close monitoring of compliance with conditions precedent set by ORT, the American umbrella PVO responsible for project implementation, for payment of the next 30% of funds to BETEC/DVV/ACEC. In particular, the Association has been required by ORT to produce a detailed workplan demonstrating how further delay will be minimized, if not avoided, and has required the Association to correct the deplorable and unsafe working conditions of Zairian laborers at the construction site.

Overall, ORT/Kinshasa has an excellent record for managing this project. About 80% of procured commodities arrived as scheduled and loss and breakage is under one percent. Civil engineering and electrical contracting have both generally been of good quality. The project was originally conceived primarily as a rapidly dispersing commodity supply project, however, ORT has managed to evolve an important institution building component, elements of which should serve as a model for future PVO assistance projects.

VI LESSONS LEARNED

Lessons learned from project design and implementation follow: (1) The umbrella project design concept is replicable and should, with some modifications, serve as a point of departure for the design of future PVO assistance projects; (2) The purpose of a PVO assistance project should be reoriented from ends (e.g. roads built, drugs supplied) to the means for ensuring that the desired ends are achieved (i.e. development of local PVOs as viable development agencies). By strengthening the means (local PVOs as implementors), USAID will provide Zairians with the tools to undertake their own development, the training to use those tools and the capacity to make new tools. (3) USAID should ensure that local PVOs receiving assistance are either genuinely indigenous in that most of their management and staff are Zairian nationals or that they have a proven and demonstrated commitment to Zairianization and a plan for achieving it. (4) Sustainability is a realistic prospect for many development activities in Zaire, however, it must be planned for in some depth from the project design stage and not merely stated as a laudable goal. (5) Institution building as a component of O97 transformed the project from one which risked being merely a commodity transfer activity (a kind of international welfare system) to a self-help program which added to local skills and capabilities.* (6) The umbrella approach offers a means to reduce the USAID management burden and the prospect of reduced costs if recommendations on indigenization of some staff positions are followed.

* It is noted, however, that USAID has other projects in its program which do stress institution building.

PVO ECONOMIC SUPPORT PROJECT 097
 FINAL EVALUATION
 PROJECT DESIGN, MANAGEMENT AND ADMINISTRATION

SECTION I: ORT/USAID PROJECT MANAGEMENT

1. IT IS RECOMMENDED THAT ORT PREPARE TWO SETS OF BASIC PROJECT AND SUBPROJECT DOCUMENTS FOR TRANSFER TO USAID AT PACD. ORT SHOULD ALSO PREPARE A BRIEF ANNOTATED BIBLIOGRAPHY OF THESE DOCUMENTS AND CIRCULATE IT AMONG AID AND OTHER DONORS APPRISING THEM OF THE USEFUL DATA GENERATED BY THE PROJECT WHICH MAY BE OF USE ELSEWHERE. (REF. ANNEX 1, PART III)
2. IT IS RECOMMENDED THAT USAID INCLUDE IN FUTURE COOPERATIVE AGREEMENTS PRECISE INFORMATION REGARDING THE INSTITUTIONAL CONTRACTOR'S RESPONSIBILITIES IN THE AREA OF EXONERATIONS, SHIPPING, PERMISSABLE HOUSING STYLES, ETC.. (REF. ANNEX 1, PART 3.4.3)

SECTION II: ECZORT RURAL HEALTH SUB-PROJECT

3. IT IS RECOMMENDED THAT SINCE ECZORT'S COMMODITY DISTRIBUTION WAS SUCCESSFUL, A SIMILAR APPROACH SHOULD BE CONSIDERED BY SANRU II. (REF. ANNEX 1, PART 5.5 AND 5.6)
4. IT IS RECOMMENDED THAT SINCE ORT HAS BEEN COMPARATIVELY MORE EFFICIENT IN PROCURING COMMODITIES FOR SANRU THAN USAID, ORT MIGHT BE CONSIDERED FOR THE PROCUREMENT OF COMMODITIES IN THE FUTURE FOR SANRU II IF THIS IS FEASIBLE. (ANNEX 1, PART 5.6)
5. IT IS RECOMMENDED THAT FOR FUTURE HEALTH ACTIVITIES MORE EMPHASIS SHOULD BE LAID ON QUALITY CONTROL: (1) PRIOR TO ASSISTING HEALTH ZONES, THEIR NEEDS SHOULD BE ASSESSED SO AS TO RESPOND MORE TO THE INDIVIDUAL NEEDS; (2) MORE FINANCIAL SUPERVISION SHOULD BE SCHEDULED. (ANNEX 1, PART 5.6)
6. IT IS RECOMMENDED THAT SANRU CONSIDER EMPLOYING A CONSTRUCTION TECHNICIAN IN KINSHASA TO ACT AS A "CIRCUIT RIDER" TO TEACH BRIEF SEMINARS IN PRACTICAL MASONRY, CARPENTRY AND OTHER BASIC SKILLS IN VILLAGES. TWO OR THREE VILLAGERS COULD BE CHOSEN FOR THIS TRAINING AND WOULD RECEIVE CERTIFICATES. ONE WOULD BE NAMED THE VILLAGE WORK FOREMAN CHARGED WITH IMPROVING LOCAL WORKMANSHIP. (ANNEX 1, PART 5.6)
7. IT IS RECOMMENDED THAT INSTITUTION BUILDING SHOULD CONTINUE TO BE STRESSED AS AN IMPORTANT COMPONENT OF SANRU II. AMONG THE ACTIONS THAT SHOULD BE TAKEN ARE: (1) ENSURING HIGHER QUALITY HEALTH PERSONNEL TRAINING; (2) DEVELOPING AND PROMOTING TRAINING MATERIALS; (3) WHEN LONG TERM EXPATRIATE TECHNICAL ASSISTANCE IS USED, A ZAIRIAN SHOULD BE ASSOCIATED TO ENSURE TRANSFER OF TECHNICAL "KNOW HOW". (ANNEX 1, PART 5.6)
8. IT IS RECOMMENDED THAT FURTHER ASSISTANCE SHOULD CONCENTRATE ON HEALTH CENTERS WHERE THE NEED IS GREATEST AND FOCUS MORE ON MINI INTEGRATED SELF-HELP PROJECTS. EXPERIENCES LIKE THE LOKO HEALTH CENTER IN EQUATEUR AND THAT OF D.P.P. IN BANDUNDU SHOULD BE EXAMINED TO INTEGRATE HEALTH AND SMALL ECONOMIC ACTIVITIES. (ANNEX 1, PART 5.6)

SECTION III: DPP FARM-TO-MARKET SUB-PROJECT

9. IT IS RECOMMENDED THAT FUTURE PVO ASSISTANCE PROJECTS IN ZAIRE BE DESIGNED TO PERMIT REASONABLE OVERHEAD COSTS TO BE BILLED BY LOCAL PVOs ONCE THEY ARE DETERMINED AND VERIFIED BY GENERALLY ACCEPTED ACCOUNTING PRINCIPLES. THEY MAY BE PART OF A LOCAL PVO PROJECT CONTRIBUTION BUT SHOULD BE SHOWN AS SUCH IN WRITING AND IN DETAIL. (ANNEX 1, PART 6.2)

10. IT IS RECOMMENDED THAT THE ISSUE OF USER FEES BE DEALT WITH AMONG DONORS TO PROMOTE A JOINT APPROACH TO THE ISSUE WHILE REFRAINING FROM INCLUDING ESTABLISHMENT OF LOCAL ROAD USER FEES AS A DELIVERABLE IN COOPERATIVE AGREEMENTS. (ANNEX 1, PART 6.6)

11. DPP HAS RECENTLY REACHED A CONSENSUS ON ITS REORGANIZATION. DPP NEEDS FURTHER MANAGEMENT ASSISTANCE. IT IS RECOMMENDED THAT ORT PROVIDE SHORT-TERM MANAGEMENT HELP THROUGH THE PACD (9/30/87) TO INSTITUTIONALIZE THE CHANGES WHICH HAVE BEEN MADE. IF NECESSARY, ADDITIONAL COUNTERPART FUNDS COULD BE MADE AVAILABLE. THE ORT PROJECT MANAGER PREPARED A BRIEF PROPOSAL FOR THIS PURPOSE. IT APPEARS AS ANNEX 6. A TRANSITION TO POST-PACD SHOULD ALSO BE EFFECTED DURING THIS PERIOD POSSIBLY WITH INPUT FROM USAID PROJECT 096. (ANNEX 1, PART 6.7)

12. IN VIEW OF THE IMPENDING START UP OF USAID PROJECT 102, THE PROJECT SHOULD GIVE FULL CONSIDERATION TO DPP'S REQUEST FOR A LONG TERM AGRICULTURAL EXTENSION TRAINER, EXAMINE THE ROLE OF WOMEN IN ALL ASPECTS OF PROJECT DESIGN AND CONSIDER WHETHER A DISCRETE COMPONENT FOR WOMEN WOULD BE APPROPRIATE. (ANNEX 1, PART 6.7)

SECTION IV: KODA FALLS MINI-HYDROELECTRIC SUB-PROJECT

13. IT IS RECOMMENDED THAT THE ORT PROJECT MANAGER CONVENE AND CHAIR A CAREFULLY PREPARED JOINT MEETING OF CECA SUB-PROJECT PERSONNEL AND REPRESENTATIVES OF THE KWANDRUMA COMMUNITY TO BE HELD IN KWANDRUMA VILLAGE. THE AGENDA SHOULD INCLUDE DISCUSSION OF THE CURRENT STATE OF SUB-PROJECT PROGRESS, REVIEW OF USER FEE RATE OPTIONS AND A DISCUSSION OF THE ROLE OF KWANDRUMA REPRESENTATIVES IN CURRENT SUB-PROJECT ACTIVITIES AND THE FUTURE MANAGEMENT STRUCTURE OF THE HYDRO FACILITY. FURTHER, THE ORT PROJECT MANAGER SHOULD SPEAK WITH THE CHIEF OF THE ZABU GROUPEMENT TO DETERMINE IF THE CHIEF WOULD WISH TO HAVE A PUBLIC "TOWN MEETING" WHERE QUESTIONS ABOUT THE HYDRO FACILITY COULD BE ANSWERED. SINCE MANY LOCAL PEOPLE SPEAK MORE SWAHILI THAN FRENCH, THE ORT PROJECT MANAGER SHOULD BE ACCOMPANIED BY ORT'S MANAGEMENT TRAINING SPECIALIST, CIT. TABARO, WHO IS FLUENT IN BOTH SWAHILI AND FRENCH. (ANNEX 1, PART 7.2)

14. IT IS RECOMMENDED THAT ORT URGE (AND IF NECESSARY REQUIRE) CECA TO HOLD REGULAR MONTHLY MEETINGS WITH KWANDRUMA REPRESENTATIVES UNTIL THE FACILITY IS FULLY OPERATIONAL. THEREAFTER, IT IS EXPECTED THAT KWANDRUMA WILL BE REPRESENTED ON THE PROPOSED KODA HYDRO BOARD OF DIRECTORS. IT IS ALSO RECOMMENDED THAT ORT AND CECA CONSIDER THE UTILITY OF ESTABLISHING A UNIFIED CECA-KWANDRUMA COMMUNITY ADVISORY COMMITTEE OF ELECTRIC CONSUMERS TO MEET QUARTERLY FOR THE PURPOSE OF CONSIDERING THE EFFECTS OF BOARD DECISIONS ON

- CONSUMERS. THE JOINT COMMITTEE WOULD HAVE NO LEGAL STANDING BUT IT WOULD OFFER A REGULAR FORUM IN WHICH BOTH MISSIONARY AND KWANDRUMA CONSUMERS WOULD BE ABLE TO DISCUSS THEIR CONCERNS WITH EACH OTHER ABOUT SERVICE, PRICES, SAFETY, ETC. (ANNEX 1, PART 7.2)
15. IT IS RECOMMENDED THAT ORT REQUEST A COMPREHENSIVE TRAINING PLAN FROM CECA FOR ALL LOCALLY HIRED PERSONNEL TO BE SUBMITTED TO ORT NOT LATER THAN JUNE 15, 1987. (ANNEX 1, PART 7.2)
16. IT IS RECOMMENDED THAT A HYDRO SYSTEM MANAGER BE IDENTIFIED AND APPOINTED ON OR BEFORE JUNE 15, 1987. (ANNEX 1, PART 7.2)
17. IT IS RECOMMENDED THAT USAID, ORT AND CECA EXAMINE THE POSSIBLE MEANS BY WHICH THE KODA SYSTEM MANAGER POSITION MAY EVENTUALLY BE ZAIRIANIZED. (ANNEX 1, PART 7.2)
18. IT IS RECOMMENDED THAT AID INVESTIGATE WHETHER THERE IS A MEANS TO HOLD SUB-GRANTEES TO THE SAME REQUIREMENTS AS GRANTEES WITH RESPECT TO THE PROHIBITION ON ALL FORMS OF EMPLOYMENT DISCRIMINATION (RACE, GENDER, RELIGION, ETC.). USAID AND ORT SHOULD WRITE TO CECA ENCOURAGING THEM TO RECONSIDER THEIR POSITION RESTRICTING EMPLOYMENT ON THE PROJECT TO CHRISTIAN PROTESTANTS AND ADOPT A STATEMENT IN ITS ARTICLES OF INCORPORATION OR BY-LAWS FOR THE KODA HYDRO FACILITY GUARANTEEING THAT THE PRINCIPLE OF EQUAL EMPLOYMENT OPPORTUNITY BASED SOLELY ON MERIT WILL BE OBSERVED. (ANNEX 1, PART 7.2)
19. IT IS RECOMMENDED THAT ORT AND AFTER THE PACD USAID MAINTAIN CLOSE SCRUTINY OF WORK CONDITIONS AT THE SUB-PROJECT SITE. IF WORK CONDITIONS ARE NOT CORRECTED WITHIN FOURTEEN DAYS, THE MISSION RECOMMENDS ISSUING A STOP WORK ORDER TO PREVENT POSSIBLE INJURY AND/OR DEATH TO LABORERS ON A U.S. GOVERNMENT FUNDED PROJECT. (ANNEX 1, PART 7.3)
20. IT IS RECOMMENDED THAT ORT WRITE AN OFFICIAL LETTER TO CECA (COPY TO USAID) REITERATING THE CONDITION PRECEDENT (E.3) IN THE SUB-GRANT AGREEMENT MANDATING USAID/ORT AGREEMENT WITH THE EVENTUAL MANAGEMENT DESIGN AND URGING A SUBSTANTIAL ROLE FOR KWANDRUMA IN WHATEVER ORGANIZATIONAL FRAMEWORK IS EVENTUALLY AGREED UPON BY THE CONCERNED PARTIES FOR MANAGEMENT OF THE FACILITY. (ANNEX 1, PART 7.5)
21. IT IS RECOMMENDED THAT ORT REVIEW SINGLE AND DOUBLE TIER RATE OPTIONS WITH A VIEW TO ENSURING THE AFFORDABILITY OF THE SYSTEM FOR LOW INCOME USERS WHILE RETAINING AN OVERALL RATE STRUCTURE WHICH WILL ENSURE REALIZATION OF THE GOAL OF A SELF-FINANCING SYSTEM. (ANNEX 1, PART 7.6)
22. IT IS RECOMMENDED THAT THE DRAFT CHART OF ACCOUNTS PREPARED BY CECA BE REVIEWED BY A CHARTERED ACCOUNTANT FOR COMPLETENESS, LOGIC AND INTERNAL CONSISTENCY. (ANNEX 1, PART 7.6)
23. IT IS RECOMMENDED THAT THE AID/ORT PROJECT AGREEMENT BE EXTENDED TO DECEMBER 31, 1987 AND THAT THE ORT PROJECT MANAGER BE RETAINED FOR THESE THREE ADDITIONAL MONTHS TO ENSURE COMPLETION OF THE HYDRO FACILITY, FULL CONTRACT COMPLIANCE BY ACEC, DEVELOPMENT AND IMPLEMENTATION OF A TRAINING PLAN BY CECA

AND THE ARTICULATION OF A MANAGEMENT STRUCTURE AND USER FEE SYSTEM WHICH TAKE FULL ACCOUNT OF THE INTERESTS OF KWANDRUMA AND OTHER ZAIPIAN VILLAGES NEAR RETHY. (ANNEX 1, PART 7.7)

24. IT IS RECOMMENDED THAT A FINAL TECHNICAL EVALUATION BE CONDUCTED AFTER ELECTRICITY HAS BEGUN TO FLOW TO ENSURE THAT A SAFE AND COMPLETE SYSTEM HAS BEEN INSTALLED. AN ELECTRICAL ENGINEER SHOULD CONDUCT THE FINAL REVIEW. (ANNEX 1, PART 7.7)

25. IT IS RECOMMENDED THAT USAID UNDERTAKE AS PLANNED A MINI HYDRO SCHEME RESEARCH AND EVALUATION STUDY TO OBTAIN COMPARATIVE COST ESTIMATES, COMPARATIVE DATA ON THE DISTRIBUTION OF BENEFITS, COMPARATIVE ASSESSMENTS OF USER FEES AND LONG TERM FINANCIAL VIABILITY DATA. IN THE SCOPE OF WORK FOR THE STUDY AID SHOULD SPECIFY ITS GOALS FOR HYDRO FACILITIES WITH EMPHASIS ON HOW IT VIEWS THE RELATIVE IMPORTANCE OF AIDING ZAIRIANS DIRECTLY, AIDING ZAIRIANS INDIRECTLY THROUGH SUPPORT OF MISSION RUN PUBLIC FACILITIES (HOSPITALS) AND ASSISTING MISSIONARIES DIRECTLY WITH THEIR ELECTRIC NEEDS. (ANNEX 1, PART 7.7)

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PVO ECONOMIC SUPPORT PROJECT 097
FINAL EVALUATION
ENGINEERING ANNEX 3: RECOMMENDATIONS

A.1 CIVIL ENGINEERING: FARM-TO MARKET ROADS AND BRIDGES SUB-PROJECT

IT IS RECOMMENDED:

1. THAT USAID THROUGH ORT CONTRACT WITH AN INDEPENDENT LABORATORY SUCH:
 - A) TO EXAMINE THE FINDINGS OF THE CONCRETE COMPRESSION TESTS DONE BY LNTP TAKEN FROM CONCRETE SAMPLES OBTAINED FROM CONCRETE USED FOR ABUTMENTS AT VARIOUS BRIDGE SITES TO EXAMINE SUCH DATA, METHOD OF CALCULATIONS ETC, THEN RENDER ITS OPINION ON THE VALIDITY OF SAME AND WHAT THE CONSEQUENCES WILL BE IF THE RESULTS AS ORIGINALLY DETERMINED BY LNTP ARE FOUND TO BE CORRECT, I.E. THAT NEARLY ALL OF THE SAMPLES FAILED TO PASS THE MINIMUM COMPRESSIVE STRENGTH TESTS.
 - B) TO MAKE SITE VISITS AND EXAMINE ALL ABUTMENTS WITH A SCHMID HAMMER (SCLÉROMÈTRE) TO ESTIMATE THE AVERAGE CONCRETE STRENGTH OF EACH ABUTMENT AND RENDER ITS FINDINGS AND OPINION ON THE RELATIVE STRENGTH OF EACH.
 - C) TO MAKE RECOMMENDATIONS AS TO WHAT COURSE OF ACTION TO FOLLOW IF THE CONCRETE IN THE ABUTMENTS IS FOUND TO BE DEFECTIVE.
2. THAT AT THE MUNGA SITE - WESTERN SHORE NEAR THE MARSH AREA - REPLACE THE EXISTING 2 STEEL CULVERTS WITH A SMALL CONCRETE CULVERT (OR SMALL BRIDGE) PERHAPS 3M HIGH, 3M LONG AND A ROADWAY WITH 4M (EXACT MEASUREMENTS TO BE DETERMINED BY DPP) TO EFFECTIVELY CARRY THE LARGE AMOUNT OF WATER THAT COLLECTS IN THE AREA DUE TO THE PASSAGE OF SMALL STREAMS AND NATURAL SPRINGS THAT RUN OFF IN A DIRECTION THAT TRAVERSES THE ROAD. CONSTRUCTION SHOULD START THIS DRY SEASON AS THE EXISTING "TRACT" ROAD IS ABOUT TO BE CUT.
3. AS SOON AS THE DRY SEASON COMMENCES REMOVE (POSSIBLY WITH HELP OF USAID PROJECT 098) ALL OF THE LOOSE SANDY MATERIAL SOME 500 METERS ON EACH SIDE OF ALL BRIDGE LOCATION AND REPLACE IT WITH A MORE SUITABLE MATERIAL SUCH AS LATERITE. IF NO LATERITE IS TO BE FOUND OR UNAVAILABLE, THEN A SPECIAL MIX OF ON SITE MATERIAL STABILIZED WITH THE APPROPRIATE AMOUNT OF CEMENT (SOIL CEMENT STABILIZATION) SHOULD BE INCORPORATED INTO THE ACCESS APPROACHES. THIS WORK IS SUITABLE FOR DPP UNDER THE GUIDANCE OF OR ASSISTANCE SINCE ALL APPROACHES SHOULD BE PROPERLY SHAPED AND COMPACTED. AS MENTIONED ELSEWHERE IN THIS EVALUATION REPORT, OR STATED A BELGIAN FINANCED PROJECT WILL ADDRESS THIS TYPE OF SOIL STABILIZATION ON ROADS THROUGHOUT THE REGION; HOWEVER, TIME IS OF THE ESSENCE ON THESE APPROACHES AND WORK SHOULD BE STARTED BY DPP WITHOUT DELAY.

4. THAT WITH REGULARITY, EXAMINE ALL BRIDGES AT LEAST ONCE EVERY MONTH .FOR THE FIRST YEAR, THEN EVERY 3 MONTHS THEREAFTER - REMOVE ALL DEBRIS COLLECTED AROUND ABUTMENTS, EMBANKMENTS, GABIONS AT THE SIDES AND BELOW THE BRIDGE, AND IN BETWEEN PANELS AND TRANSOMS. MAKE SURE ALL PINS, CLIPS, NUTS AND BOLTS ARE IN PLACE AND SECURE. EXAMINE ALL PANELS AND SIDE CURBS ON BRIDGE DECKING FOR ANY DAMAGE. REPORT ANY DAMAGE IMMEDIATELY TO OR FOR ADVISE AND/OR CORRECTIVE ACTION.
5. THAT WHITE STRIPES BE PAINTED WITH REFLECTING PAINT ON EACH END PIECE - BOTH SIDES OF BRIDGE - ON ALL BRIDGES.
6. THAT WARNING SIGNS BE POSTED AT LEAST SOME 300 M FROM BRIDGES (BOTH SIDES) THAT BRIDGE IS AHEAD, AND TO GO SLOW AND CROSS BRIDGE WITH CAUTION SINCE BRIDGE IS FOR 1 WAY TRAFFIC.
7. THAT NO PARKING, OR REPAIRS TO ANY VEHICLE ARE TO BE MADE ON THE BRIDGE.

A.2 CIVIL ENGINEERING: KODA FALLS MINI-HYDROELECTRIC SUB-PROJECT

IT IS RECOMMENDED:

8. THAT CONCRETE TESTING EQUIPMENT (FOR THE TESTING OF CONCRETE SAMPLES) BE PROVIDED BY THE CONSORTIUM OR PROVISIONS MADE BY THE CONSORTIUM TO HAVE THE SAMPLES TESTED AT A PRIVATE MATERIALS TESTING LABORATORY.
9. THAT "AS-BUILT" DRAWINGS BE MADE AFTER CONSTRUCTION IS COMPLETED BY ACEC AND BETEC OF THE ENTIRE FACILITY TAKING INTO ACCOUNT ALL DESIGN AND CONSTRUCTION CHANGES. THAT AFTER "AS-BUILTS" ARE MADE, ONE COMPLETE SET BE GIVEN TO THE USAID/K'S ENGINEERING OFFICE, AND ONE COMPLETE SET BE GIVEN TO CECA. THE "AS-BUILTS" SHOULD BE MADE AVAILABLE BY THE CONTRACTOR PRIOR TO DISBURSEMENT OF FUNDS FOR THE FINAL PAYMENT.
10. THAT CONSTRUCTION CONTRACTOR D.V.V. PROVIDE TO ITS WORKERS ALL SAFETY EQUIPMENT, DRINKING WATER, ETC. AS LITED IN ANNEX 1 OF THIS REPORT.
11. THAT A LADDER BE INSTALLED ON THE INSIDE LEFT WING WALL OF THE DAM NEAR THE CLEAN OUT OPENING. (FOR SAFETY REASONS IF A PERSON ACCIDENTALLY FALLS INTO THE POOL).
12. THAT SECURITY LIGHTS BE INSTALLED ON TOP OF THE DAM, STAIRCASE AND POWERHOUSE.
13. THAT ALL PARTIES CONCERNED, USAID/K, ORT, CECA AND THE CONSORTIUM OF ACEC-BETEC-D.V.V. WORK OUT AND FIND IMMEDIATE SOLUTIONS TO PROBLEMS AS INDICATED IN SECTION IV J ABOVE; IN THE INTEREST OF WORK CONTINUITY AND COMPLETION OF PROJECT.

B.1 ELECTRICAL ENGINEERING: KODA FALLS MINI-HYDROELECTRIC SUB-PROJECT

THE ELECTRICAL SYSTEM CONSTRUCTION SO FAR COMPLETED APPEARS TO BE OF GOOD QUALITY AND TO MEET APPLICABLE DESIGN AND SAFETY STANDARDS. THEREFORE NO CHANGES ARE RECOMMENDED AT THIS TIME IN SYSTEM DESIGN, MATERIALS, AND CONSTRUCTION. HOWEVER, SEVERAL POTENTIAL PROBLEMS ARE FORESEEN IN CONNECTION WITH THE TESTING, STARTUP, AND OPERATION OF THE SYSTEM. TO AVOID OR RESOLVE THESE POTENTIAL PROBLEMS THE FOLLOWING RECOMMENDATIONS ARE MADE:

14. ARRANGE FOR A WELL QUALIFIED PERSON TO BE ON HAND TO ASSIST WITH START-UP AND TESTING OF THE TURBINE-GENERATOR EQUIPMENT. IF IT IS POSSIBLE, AN OSBERGER REPRESENTATIVE WOULD BE THE LOGICAL CHOICE TO HAVE ON HAND. THE FIRST FEW HOURS OF OPERATION OF A HYDRO PLANT ARE CRITICAL. HYDRAULIC, VOLTAGE OR BEARING PROBLEMS DURING START-UP CAN CAUSE DAMAGE WHICH COULD PLAGUE OPERATIONS FOR YEARS. THE OSBERGER REPRESENTATIVE (ENGINEER OR PLANT OPERATOR) SHOULD BE IN A POSITION TO GIVE THE VERY BEST TECHNICAL ASSISTANCE AND TRAINING AND ALSO COULD AVOID OR RESOLVE POTENTIAL LEGAL OR FINANCIAL LIABILITY IN THE EVENT OF SOME EQUIPMENT DEFECT OR IMPROPER START-UP PROCEDURE.
15. PURCHASE A DC HYPOT/THUMPER UNIT FOR USE ON THE KODA SYSTEM. IN THE CONSTRUCTION CONTRACT THERE IS PROVISION FOR A CABLE LOCATOR-FAULT FINDING UNIT. THIS UNIT SHOULD SERVE WELL FOR CABLE LOCATION AND FOR FINDING CERTAIN CABLE FAULTS, BUT IT NOT DESIGNED FOR USE ON CONCENTRIC NEUTRAL CABLES SUCH AS THOSE IN THE KODA SYSTEM. THE HYPOT/THUMPER EQUIPMENT IS THE ONLY TYPE OF FAULT-FINDING UNIT VOLTAGE CONCENTRIC NEUTRAL CABLE FAULTS. THIS EQUIPMENT IS RELATIVELY EXPENSIVE. HOWEVER, IT IS VERY EASILY COULD MAKE THE DIFFERENCE (PERHAPS SEVERAL TIMES) OF AN OUTAGE MEASURED IN HOURS INSTEAD OF ONE MEASURED IN WEEKS. REPAIR COSTS AND/OR REVENUES LOST DURING ONE SUCH LENGTHY OUTAGE WOULD LIKELY MORE THAN PAY FOR THE TESTING EQUIPMENT.
16. THE UNIT SHOULD BE CAPABLE OF APPLYING A TEST DC VOLTAGE OF 30KV OR 35KV AND SHOULD BE OPERABLE IN EITHER A LEAKAGE CURRENT CABLE TEST MODE OR A THUMPER FAULT LOCATION MODE. AN EXTERNAL POWER SUPPLY WILL ALSO PROBABLY BE NECESSARY, UNLESS ONE IS ALREADY AVAILABLE. THIS UNIT SHOULD BE ON HAND AT THE TIME THE CABLE IS ENERGIZED, IF POSSIBLE, SINCE THAT IS THE SINGLE MOST LIKELY TIME FOR IT TO BE NEEDED.
17. PROVIDE OUTDOOR LIGHTING FOR THE HYDRO PLANT AND STEP-UP SUBSTATION AREA, STAIRWAY, AND PENSTOCK INTAKE AREAS. THIS RECOMMENDATION IS EXPLAINED IN GREATER DETAIL IN PART A OF THIS ANNEX. SINCE THE FACILITIES HAVE BEEN DESIGNED TO BE IN OPERATION 24 HOURS PER DAY, THERE WILL BE MANY OCCASIONS WHERE LIGHTING OF THESE AREAS WILL BE ESSENTIAL FOR PROPER OPERATION AND MAINTENANCE ACTIVITIES.
18. UTILIZE THE TIME DURING THE ELECTRICAL SYSTEM START-UP AND CHECK-OUT PROCEDURES TO IMPLEMENT INTENSIVE TRAINING OF EVERYONE INVOLVED WITH PERMANENT OPERATION. THE SYSTEM MANAGER, PLANT OPERATORS, ELECTRICIANS, AND OTHER OPERATIONS AND MAINTENANCE PEOPLE SHOULD ALL BE INCORPORATED AT THIS TIME.

19. INSTITUTE AN ONGOING PROGRAM FOR TECHNICAL REVIEW AND TRAINING. IT IS NOT PRACTICAL TO PROVIDE SUCH TRAINING THROUGH VISITS OF OUTSIDE TECHNICAL EXPERTS ON ANY KIND OF REGULAR BASIS. THEREFORE IT IS RECOMMENDED THAT THE ONGOING PROGRAM CONSIST OF TWO PRINCIPAL PARTS.

THE FIRST PART WOULD BE A REGULARLY SCHEDULED TIME, RESERVED FOR TECHNICAL DISCUSSION, REVIEW, AND STUDY, WHEREIN ALL THOSE INVOLVED IN THE TECHNICAL OPERATIONS CAN POOL THEIR KNOWLEDGE AND EXPERIENCE. EACH PERSON WILL LEARN DIFFERENT THINGS FROM THE INTENSIVE TRAINING PERIOD, AND THROUGH GROUP DISCUSSION THIS TRAINING WILL BE EXPANDED AND REINFORCED.

THE SECOND PART OF THE TRAINING PROGRAM WOULD BE TO ESTABLISH SOME TYPE OF INFORMATION EXCHANGE WITH ANOTHER UTILITY SYSTEM OR SYSTEMS. ONE POSSIBLE UTILITY WOULD BE FALL RIVER RURAL ELECTRIC COOPERATIVE (WITH HEADQUARTERS IN ASHTON, IDAHO, U.S.A.) WHICH HAS ALREADY SHOWN INTEREST IN THE KODA PROJECT.
B-2 ELECTRICAL ENGINEERING: SOLAR PANEL INSTALLATIONS

THE ENGINEERING RECOMMENDATIONS STEMMING FROM THE EVALUATION OF THE ESCORT SOLAR INSTALLATIONS ALL CONCERN REPAIR AND MAINTENANCE OF THE EQUIPMENT. THEY ARE AS FOLLOWS:

20. DISTILLED WATER MUST BE MADE AVAILABLE AT THE STORAGE BATTERY LOCATION OF EACH INSTALLATION.
21. ARRANGE FOR A QUALIFIED PERSON TO INSPECT AND REPAIR THE DEFECTIVE REFRIGERATION UNITS.
22. ESTABLISH A WEEKLY LOG FORM FOR USE IN A MAINTENANCE CHECK. THE FORM SHOULD BE SIMPLE, BUT SHOULD FULFILL THE PURPOSES OUTLINED IN ANNEX 3 AND EXHIBIT 4.
23. IF POSSIBLE, IT IS RECOMMENDED THAT A MORE TECHNICAL MAINTENANCE CHECK BE MADE AT EACH INSTALLATION ON A SEMI-ANNUAL BASIS. THIS MAY SEEM EXPENSIVE OR DIFFICULT TO ORGANIZE. HOWEVER, IF DONE BY QUALIFIED PEOPLE, IT WILL EXTEND THE LIFE OF SOME EXPENSIVE EQUIPMENT.
24. IT IS RECOMMENDED TO PROVIDE A CARD, STICKER, OR SOMETHING EQUIVALENT ON WHICH IS WRITTEN THE NAMES AND ADDRESSES OF SOURCES FOR SERVICE OR REPLACEMENT PARTS.
25. IT IS RECOMMENDED TO INVESTIGATE THE NEED AND METHODS OF PROVIDING PROTECTION AGAINST LIGHTNING. THERE WAS NOT ENOUGH INFORMATION OBTAINED TO DETERMINE THE EXTENT TO WHICH LIGHTNING DAMAGE MAY OCCUR, BUT IT COULD POTENTIALLY BE A SERIOUS PROBLEM IN AREAS WHERE LIGHTNING STORMS ARE FREQUENT. SINCE SOLAR PANELS FUNCTION ON THE BASIS OF LIGHT STRIKING THE PANEL SURFACE, A NEARBY BRIGHT LIGHTNING STROKE WILL CAUSE A BRIEF SURGE IN THE OUTPUT OF ELECTRICITY.

II. INTRODUCTION

The PVO Economic Support Cooperative Agreement between the U.S. Agency for International Development (AID) and the American ORT Federation (ORT) was signed on September 30, 1983 for a period of four years in the amount of \$5,000,000. The Agreement states that the purpose of the project is to support the Government of Zaire's (GOZ) fundamental development objectives of self-sufficiency in basic foods and access to basic health services for the rural population. The objectives of the project as listed in the Agreement are:

- o Management and allocation of a central umbrella fund in support of all project activities, including financing and monitoring sub-project activities;
- o Upgrading indigenous PVOs as viable development agencies;
- o Implementation of PVO sub-projects that conform to GOZ/USAID development strategy in three selected priority areas.

The project was also expected to assist indigenous PVOs in Zaire in the areas of management, administration and logistics by financing sub-project activities in health, agriculture and energy by providing commodities and technical assistance. ORT, as the umbrella PVO, was expected to "initiate training programs to improve participating PVOs' institutional capability." As a result of this mandate, ORT concluded three sub-project agreements as follows:

1. "Operation and Maintenance of Rural Outreach Clinics" with the Eglise du Christ au Zaire (ECZ).
2. "Rehabilitation and Maintenance of Farm-to-Market Access Roads and Bridges" with Développement Progrès Populaire (DPP) of the Diocese of Idiofa.
3. "Mini-hydroelectrification for Schools, Hospitals and Villages," with the Evangelical Community of Central Africa (CECA).

The largest proportion of project funds was expended for the provision of commodities through the three sub-project activities (96% of funds for ECZ, 90% for DPP and 58% for CECA were spent on commodities while another 32% of the hydro project's funds were for sub-contractor's fees.) The balance was spent for project management, training and technical assistance. The project was originally conceived of by AID as a rapidly disbursing commodity supply project. The Cooperative Agreement was rushed to completion on the last day of FY 1983 in order to obligate five million dollars during that fiscal year. To do so, AID waived a number of its usual practices that, in other projects, would normally have produced baseline data and a substantive Project Paper against which project activities and outputs might later be measured and evaluated.

Despite inadequate pre-project preparation by USAID, the project has met most of its objectives and can, on balance, be judged a success. The definition of "success" by the Evaluation Team is considered elsewhere in this report, however, the term refers to the achievement of quantifiable outputs

(commodities procured, bridges built, etc.) and ORT's success in increasing the emphasis on institutional development during the course of project implementation. The lack of baseline data and a substantive Project Paper make an assessment of the project's "success" in terms of the broader purpose of the project both subjective and incomplete. Rather than dwell on speculations about the possible percentage of increase in agricultural goods which may cross project bridges or guess the number of persons receiving health care in upgraded clinics compared to pre-project levels, the Evaluation Team has focused on the lessons learned from this project which may be most useful in the design of future PVO assistance projects in Zaire. It is in this spirit that comments are offered in the following section and elaborated upon in the first part of Annex 1.

II. PRINCIPAL CONCLUSIONS RELATING TO KEY ISSUES

2.1 Institution Building

As mentioned, USAID perceived the project primarily as a rapidly disbursing capital input project concerned with expending funds on schedule and for the appropriate commodities. Long term institution building was a secondary objective which was viewed by USAID as mostly a means to increase local capacity to carry out infrastructural developments.

ORT placed greater emphasis on the institutional development aspects of the project and sought to expand the scope of its involvement in this arena. More precisely, ORT defined "institution building" as a systematic program to strengthen the ability of a local institution to deliver services effectively and efficiently. Institution building within the project has included assistance in reorganizing institutions, management assistance interventions, management training and administrative development. When combined, these initiatives enhance not only long term institutional viability but the ability to become self-sustaining with respect to the provision of goods and services.

A few years ago, AID published a checklist for projects concerned with institution building. The checklist was derived from an evaluation of 302 AID-financed projects with an institution building element. Some of the key "lessons learned" are drawn from that report and compared to ORT performance in a chart beginning on page 9 of Annex 1. The chart and other data in Annex 1 demonstrate that ORT had a significant and positive impact in strengthening two of the local PVO institutions (ECZ and DPP). In the case of CECA, less institution building was required since CECA draws on the skills of its American missionary community.

Probably the major error in the CECA sub-project from the perspective of institution building (assuming indigenization is a major goal) was sending the American CECA project manager to the U.S. for training on the understanding that he would return to teach his new skills to Zairians. ORT did not exhaust the possibilities of identifying a Zairian to train. Further, the CECA manager did not inform ORT prior to training that he would leave Zaire from July 1987-July 1988, the critical period for start up of the hydro system. Had ORT known of the manager's plans, ORT would not have sent him abroad according to the ORT manager. By his own estimate, only 15% of what the CECA manager learned in the U.S. has been transferred to anyone on site and a replacement has not yet been identified.

2.2 Sustaining Project Objectives

Institution building is one means of sustaining project objectives, another is by promoting self-financing mechanisms and preventing donor dependency. Yet "sustainability" has a third element - that is the quality of innovation and creativity. This cannot entirely be learned since it involves cultural norms and concepts of leadership and risktaking, however, management structures can be set up which encourage or stifle these qualities.

Each of the PVO sub-projects contained a self-financing aspect as follows:

The ECZORT rural health sub-project

The basic self-financing concept rests on the assumption that an initial stock of medicines can be sold to consumers at a rate which will permit the rural clinics to re-stock medicines and pay local salaries with the user fees collected. The use of solar panels to generate electricity was seen as a method to preserve the cold chain with minimal recurrent cost. Rehabilitation of clinics gave rural communities a sense that a renewed effort to provide basic health services was underway.

The DPP farm-to-market sub-project

The self-financing concept centered on user fees for those roads and bridges in the project zone. Several options have been explored by ORT, ILO, the World Bank and others from road permits to bridge fees but no feasible approach has yet been found in light of the GOZ's position that roads and road maintenance are a public service. Private maintenance by some commercial users occurs but Zaire is very far from devising a self-financing road maintenance system at local levels as envisaged in the Cooperative Agreement.

The CECA Koda Falls hydro facility

Self-financing is probably most feasible for this sub-project since there is a core group of consumers able and willing to pay for the service while costs can easily be measured and controlled. Consultants are currently developing rate schedules to cover operating costs, amortization and a development fund (serving as a fictive loan repayment to demonstrate financial viability to potential donors/investors in future projects.)

The "third element" - innovation and creativity - is the most difficult to assess. ORT was aware of this element and sought to motivate trainees as well as instruct them, sought to use role playing and gaming to gain the active involvement of staff in training seminars and sought to encourage supervisory staff to seek out initiative and reward it.

On the whole, therefore, ORT was most successful in terms of sustainability in (a) delivery of commodities which help increase net assets of local PVOs, (b) institution building through training and technical interventions and (c) working to make the hydro scheme self-financing. Some success was achieved in self-financing rural health centers and some contribution was made in stimulating innovation and leadership. No progress was made in self-financing roads and bridges.

A key constraint to achieving financial sustainability is recurrent costs. For rural health zones, for example, inflation and the continuing deterioration of the value of the Zaire plus breakage, theft and loss make drug re-supply at the same level plus coverage for local salaries quite difficult. One option may be to use counterpart funds as a recurrent cost cushion on a sliding scale (e.g. 50%, 30%, 15%) over, say, three years to help stabilize the system and give clinics more time to adjust their system and services to local realities.

2.3 Replicability of the Project Design

As noted above, the Mission has concluded that the umbrella design, with modifications, is replicable and should be used as a framework for future PVO assistance in Zaire. Four aspects of the replicability of the project design are summarized here: (1) purpose of PVO projects, (2) indigenization, (3) criteria for selection of sub-projects and (4) relationship to USAID. Five other aspects are discussed in Annex 1 (structure of the design, function of the umbrella PVO, criteria for selection of an umbrella PVO, cost effective innovations, and criteria for selection of local PVOs).

2.3.1 Purpose of PVO Assistance Projects

The purpose of project 097 was stated in the Cooperative Agreement as follows: "to support...self-sufficiency in basic foods and provide access to basic health services to the rural population of Zaire." One of the three objectives of the project was listed as "upgrading indigenous PVOs as viable development agencies." The purpose of PVO assistance projects should be to "assist PVOs." In other words, the second project objective should rather be the project purpose since it is through the PVO that objectives such as increasing food production will or will not be achieved.

This is more than an academic distinction because it reorients the entire conception of a PVO project away from what are essentially ends (more food, better health) and focuses on the means (development of viable PVOs as development institutions) to attain those ends. By strengthening the means and by ensuring that the PVOs in question are genuinely indigenous, one provides Zairians with the tools to undertake their own development and trains Zairians in the efficient use of those tools and how to make new tools. In short, if the means (viable PVOs) become the ends (project purpose), then the goals of improved human well-being will be generated and sustained from the efforts and ingenuity of the Zairian people.

2.3.2. Indigenization

How does one build a project which becomes rooted in a local culture and local community such that it ceases to be or to be thought of as a "project"? How does a project become internalized as part of the web of local practices and capabilities? How can a project be designed so that this potential is inherent in the design and can eventually be realized?

A project will evolve into the local milieu if it is designed to promote and ensure eventual indigenization of project activities. Let us take again the example of DPP and CECA/Rethy. DPP has development as its primary purpose and it works with its affiliate COMBILIM to sustain its development activities financially. A complementarity and outreach to Zairian villagers is evident

between the commercialization of COMBILIM and the extension, training and community development of DPP. DPP's Executive Coordinator and entire staff are Zairian as is the director of COMBILIM.

At CECA/Rethy, after sixty years, the center clearly has evangelization as its primary purpose and remains an expatriate center living its own life and providing health care services to the neighboring Zairian communities. The value of the health care is not in dispute. The lack of commitment to indigenization that was so clearly evident there means that the Koda hydro facility will probably not become a Zairian facility but will remain "the American missionaries' electricity system built by the American government which will also benefit some Zairians." While the Koda Falls facility may have been worthwhile for other reasons, it should not set a model for future PVO assistance if the definition of the purpose of PVO assistance outlined above is accepted.

Finally, to promote indigenization, the project design should contain a plan for Zairianization at a pace and at levels which will be consistent with Zairian capabilities and reflective of planned Zairian training opportunities.

2.3.3 Criteria for selection of sub-projects

The following criteria are among those the Mission believes USAID should apply when considering, or having an umbrella PVO consider, financing sub-project activities:

1. focus on projects which strengthen institutions and do not merely deliver commodities;
2. focus on projects which address institutional problems globally and do not confine themselves to support of a "unit" or "division" within a larger institution. The part cannot ultimately stand without the whole.
3. focus on projects which avoid creating donor dependency and have a specific timetable and detailed, realistic plans for achieving self-financing status;
4. focus on projects which conceive of sustainability not as an "activity" (e.g. road building) but as the function of the entity building the roads;
5. focus on projects which can become self-sustaining AND are capable of growth. A project may eventually create a condition of replenishment (e.g. ECZORT clinics, possibly) but may be using all its energies to avoid slipping back to the previous state (i.e. having each re-supply of drugs be somewhat less than the last as inflation erodes self-financing). Income generating projects as adjuncts to the ECZORT effort, for example, might have combined to generate the extra revenues villages will need in the future to maintain the availability of basic health care. An example might be to station an animateur attached to SANRU in a village with the objective of helping villagers to plan and implement an income generating activity with proceeds going to help maintain the clinic and its supplies;
6. focus on projects with genuine local roots. At DPP, for example, Zairians are building their own institutions, defining their own priorities and working in the local villages of their relatives and friends. There must be other such local PVOs;
7. focus on projects which can localize their assistance and have a grassroots network to build on so their management and technical expertise can be shared with the lowest units of social and economic organization;
8. continue to focus on USAID's priority sectors. They make good sense

and offer considerable scope for creative activities within the criteria outlined above.

2.3.4 Relationship to USAID

There are several advantages to USAID in establishing an umbrella PVO project, including:

1. the use of PVOs is supported by Congress;
2. PVOs are normally less expensive than contractors;
3. an umbrella PVO with an American chief of party and mostly Zairian technical and support staff would be even less expensive;
4. an umbrella project will reduce the management burden on USAID and allow USAID to set up a "mini-USAID" to handle a number of worthy but small scale projects;
5. an umbrella project might also group some non-PVO activities such as Peace Corps affiliated projects under its mandate;
6. the PVO approach is consistent with USAID's overall objectives as articulated in the CDSS.

III. PROJECT PERSONNEL, MANAGEMENT AND ADMINISTRATION

3.1 Personnel and Staffing Pattern

Like the project itself, the staffing pattern emerged in response to the changing needs and priorities of the project. The Cooperative Agreement anticipated 60 person months of expatriate technical assistance whereas 130 were eventually delivered. While the tasks performed by the additional expatriate staff were necessary and contributed to project objectives, the Mission concludes that host country nationals (HCN) could have been recruited for the two positions of health coordinator and management specialist at a LOP savings of at least \$110,000.

The original project design included the post of procurement specialist. This post was later deleted by USAID and the ORT project manager concurred. The Mission agrees that an expatriate procurement specialist was not essential in view of the distribution of procurement tasks between sub-project staff and ORT/New York. Of greater value would have been a full-time HCN exoneration and customs specialist.

Initial project difficulties were caused in part by the rapidity with which the project was designed and the lack of a Project Paper, however, ORT's failure to bring the new ORT project manager (who had never worked for ORT previously) to ORT's headquarter's for initial orientation and briefings also contributed to initial poor communication among ORT/Kinshasa, ORT/headquarters and USAID. Overreaction by the project manager compounded difficulties. After the Mid Term Review, however, inter-personal relations ceased to be a significant issue.

The project also delivered significant amounts of short term consulting assistance (25 consultants over the LOP), much of it supplied by locally recruited personnel. A number of these consultancies proved to be of major importance to the achievement of the project's objectives (e.g. NRECA, CIDEP/CPA, Technoserve).

Overall, the quality of personnel assigned to the project was good. The ECZORT technical coordinator and health coordinator were praised by all parties, the management specialist's work was satisfactory and the civil engineer was technically competent but his work suffered from too infrequent field visits. The HCN long term management training specialist was warmly praised by his colleagues and trainees. The project manager did an exceptionally good job managing the project and working to institutionalize project outputs. The project manager has a firm grasp of development and the conceptual and organizational skills to transform his ideas to reality.

3.2 Management Support, Administration and Logistics

The Evaluation Mission has been favorably impressed with the overall planning, policy development and implementation effort of the ORT/Kinshasa office. Project documentation is complete, well-organized and represents an important resource for the design of a future PVO umbrella project as well as for similar projects being undertaken by USAID in health and infrastructural development. Financial management was also a strong point of the project. The recent audit confirmed that ORT's local accounting system and procedures were sound.

3.3 Cost Effectiveness

The overall cost of project management is difficult to determine since it depends upon partially subjective judgments as to what percentage of the time of each staff person represents technical assistance and what percent represents project management. The Mission gathered and made its own estimates and related these to both the dollar and counterpart budgets. For both budgets, project management was certainly under 20% and probably under 18% with a slightly lower percentage of counterpart funds used for management tasks. (See Annex 1, part 3.2.3.1)

The Mission was also asked to compare house and office rents with those of USAID and learned that the ORT project manager's house rents for 40% less than the average current USAID house rental while office rent is also reasonable. The major areas where cost reductions could have been realized were in hiring HCNs for the two expatriate posts cited above and better management of the counterpart fund account to minimize idle cash.

3.4 Procurement

The PVO Support Project was, above all, a commodity procurement project. Although ORT had considerable difficulty with its procurement system, most commodities arrived in Zaire without excessive delay and without constraining project objectives unduly. The longest delay and greatest confusion occurred in connection with the procurement of the solar panels for the ECZORT sub-project. ORT procured hundreds of tons of bridges, hydroelectric machinery, solar energy systems, vehicles, pharmaceuticals, medical equipment, culverts and other items. It is estimated that 80% of the items came as ordered the first time and 100% eventually. In terms of value, about 80% arrived as scheduled. Less than one percent arrived damaged.

The issue of procurement waivers recurred throughout the LOP. In francophone Africa, many U.S. suppliers are either absent or not competitive

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with local or European suppliers. Nonetheless, it should be recalled that the project was an ESF commodity supply project whose major aim was the provision of American made products in conformance with Congressional and AID regulations.

During the project, 24 waivers were issued and one was rejected. Of the waivers for the ten largest items by value, USAID took an average of 6.5 months to decide whether to issue the waiver (varying from 1.5 to 10.5 months). The remaining 14 small waivers took from two to six weeks. The rejected waiver took eight months for a decision. Clearly, the waiver system needs reform since delays of several months per waiver cannot help but constrain project activities. In this project, the waiver system, did not result in the purchase of American goods. While the waiver requirement is clearly a function of Congressional legislation, the Mission believes that - at least for sub-Sahara Africa - the outright abolition of the waiver system would probably have little effect on the volume of American purchases while significantly reducing paperwork and wasted personnel time not to mention project implementation delays.

The major difficulty in receipt of commodities has been obtaining GOZ exonerations in a timely fashion. USAID previously handled exonerations, however, as an institutional contractor ORT was required to handle its own. The major constraint has been with the customs service since ORT correctly has resisted the provision of improper gratuities. The Mission recommends that USAID convene a half-day mini-conference of contractor project managers and USAID staff to seek a coordinated approach to resolving or at least lessening this constraint.

IV. USAID Project Backstopping

The Cooperative Agreement mandated USAID's "substantial involvement" in project supervision and decisionmaking. From USAID's perspective, the ORT management team was recently arrived in country, did not have the benefit of a detailed Project Paper for guidance and was not familiar with the sub-project grantees with which USAID wanted ORT to sub-contract. The ORT project manager believed the level of USAID's involvement to be burdensome and worked to lessen it. Difficulties caused by this difference in perspective were reduced substantially once the sub-grant agreements were approved and USAID gained more confidence in ORT's management abilities.

Regarding USAID's administrative backstopping, the Mission found both USAID project officers to be well-informed about the status of the project and interested in its successful implementation. The current project officer was most helpful and provided the Mission with a detailed initial briefing on USAID's concerns and interests. The Evaluation Mission also received excellent secretarial support from USAID during preparation of this report.

V. TRAINING

Summary of the Training Annex

"Each sub-project had both a management and a technical training component. The training strategy and methodological approach used by each sub-project varied.

For DPP, an organizational development approach was used. A diagnosis of management dysfunctions was carried out. Problem areas faced by the institution were detected and a number of actions for training in basic management skills were recommended. Course materials were developed by the project. Nearly all DPP managers attended the five training sessions. Having examined the course materials, the management specialist on the evaluation team has determined that they are of high quality, but the sequential order in which they were presented might be improved.

Through ECZORT, management training and a number of technical courses were delivered. While the management course was taught at the national level, a more decentralized strategy of regional and zonal training was used for the other courses. A rigorous methodological approach was used to develop materials for the management training course. The whole effort began by a training needs assessment in a number of health zones; the results were used as a guide to develop the materials. Four modules focusing on human, material, financial and drug management were produced and tested on 45 MCZ's and PHZ administrators.

A follow up evaluation of the first four modules was carried out ten months after they had been tested, leading to important revisions. They are now in final form. These modules are of high quality. They are based on the principles of adult learning methodology. While four modules are ready for national use, two (planning and primary health care) need to be evaluated.

At the regional level, two types of courses were delivered: drug management and vehicle repair for mechanics. ECZORT had planned to train 30 pharmacists and 37 were actually trained while 44 instead of 66 mechanics were trained. At the zonal level, ECZORT financed five types of courses to train community health workers and development committee members. The quantitative objectives that had been set for training at this level were largely surpassed, however, the team has reservations about the quality of the training offered.

Training at the Koda sub-project took place both in the U.S. and locally. The sub-project manager attended a course on general management, construction, operations, maintenance and administration of a hydroelectric plant. At the local level a few people were taught basic electricity and some math and physics. The U.S. based NRECA training program was well designed but few of the skills learned by the sub-project manager have been transferred to Zairians. All the Zairian employees are support, staff none of whom have the educational foundation to absorb the managerial and engineering concepts that the manager learned in the U.S."

VI. The ECZORT Sub-Project

In view of the ongoing USAID SANRU health care project, it is appropriate to ask why a seemingly parallel health care entity would have been established by USAID as a PVO sub-project.

The answer lies in U.S. Congressional objections to financing projects through the GOZ. SANRU works with the Department of Health as well as ECZ. ECZORT was, therefore, a convenient vehicle through which necessary commodities could be delivered to complement the SANRU project and reinforce its capabilities.

As it turned out, ECZORT was able to provide considerably more assistance than the delivery of commodities (even though 96% of the project by value was reserved for commodities). According to ECZORT staff interviewed by the Mission, ORT (1) provided badly needed commodities more efficiently than was the norm for SANRU (SANRU was experiencing 25% loss of equipment and delays of up to three years); (2) was able to develop administrative systems for ECZ which were adopted by them and greatly increased their efficiency and recordkeeping capabilities; and (3) provided needed technical and management training.

Project Outputs include over 200 rural health clinics rehabilitated, \$880,000 worth of drugs and medical equipment procured and delivered to some very remote areas, over \$300,000 worth of solar energy equipment delivered and training provided to over 125 doctors, administrators, pharmacists and regional technical coordinators in health management. Health training modules were also developed.

Whereas the quality of workmanship of the "rehabilitation" in most of the clinics visited by the Mission was unsophisticated, what is more important is that primary health care in rural Zaire is based upon community participation and donated local labor. Most rehabilitation consisted of minor repairs to roofs, windows and walls and a fresh coat of paint. The GOZ health care system had virtually collapsed so the mere presence of a rural clinic painted, staffed by a dispenser and stocked with some basic medicines was a step forward.

Of particular note is the installation of solar refrigerators which have helped secure the cold chain vital for vaccines and certain medications. At one hospital, the Mission saw a dramatic example of the solar system at work. It was used as a backup to power oxygen supplies for premature infants and as emergency lighting for the operating theatre. The system just at that one hospital was credited by the chief medical officer with already saving several lives. The electrical engineer notes that the systems are properly installed and well maintained except for the lack of distilled water for the batteries in some locations.

The effect on the provision of "seed stocks" of medicines on the development of a sustainable user fee and re-supply system has been mixed. In reviewing the health coordinator's trip reports, it was noted that in some communities user fees are "normal and expected" and some centers have been self-financing for several years. Others have been less successful. In some areas project medicines are co-mingled with general supplies making project monitoring and analysis of project impact difficult. Since there are numerous variables affecting the ability of a given clinic to become self-financing (economic condition of the health zone, level of activity of the local health committee, length of time of clinic operation, presence of expatriates, etc.), there is clearly no single formula leading to self-sustainability. Consequently, the forthcoming USAID study on a wide range of cost-recovery systems, to be undertaken by the centrally funded REACH project, will have important consequences for ECZ's continuing efforts to make rural clinics self-sustaining.

Overall, the ECZORT sub-project has been successful in its major purpose of commodity provision while also providing important institutional supports for ECZ which are now being incorporated into SANRU. In the future, health assistance should be channelled through the existing SANRU management structure and not placed under a separate PVO umbrella project.

VII. The DPP Roads & Bridges Sub-Project

The DPP sub-project's objectives were to rehabilitate 750 kms of feeder roads by replacing aging ferries with bridges in nine locations, installation of culverts and improvement of side drainage at selected sites. The sub-project also provided management training and technical assistance to DPP. A summary of the engineering assessment of this sub-project follows.

The DPP personnel interviewed by the Mission had praise for ORT's training interventions, particularly the "facilitation workshops" which provided a framework in which DPP was able to reorganize its overall structure and relationship with its commercial affiliate (COMBILIM). The ORT-assisted recent resolution of several longstanding management problems combined with the ORT-financed Technoserve consultancy in the accounting area has created an opportunity for significant institutional strengthening in the coming months. For this reason, Annex 6 is appended, which outlines ORT's and the Evaluation Mission's recommendation regarding further management assistance to DPP which could be completed before the PACD. In brief, ORT should assist DPP to prepare job descriptions, implement its new organizational structure and prepare a two year institutional development plan.

ORT's approach to management assistance was to tie the action components of sub-project activities to the institutional development interventions so that DPP personnel would be able to apply the theoretical aspects of management to the daily requirements of project execution. ORT was able to build into the design of the project technical and management interventions which served to build DPP as an institution and enhance its prospects for long term sustainability.

The most frequent criticism from DPP staff was the sub-project prohibition on their invoicing of any overhead charges. Although ORT made every effort to keep DPP's costs down by supplying multiple copies of forms, paying local transport of laborers going to the construction sites, etc., DPP still believed that implementing the sub-project cost the organization money in personnel time and for overhead items. The Mission believes that in future umbrella type projects, a small overhead charge in some cases may be warranted for local PVOs who receive sub-grants.

The sub-project was monitored by the ORT engineer for two years, however, the quality of supervision suffered from his infrequent field visits.

ORT prepared a general report in early 1987 on the issue of user fees for road maintenance. Others have been prepared recently by the ILO and the World Bank. In brief, no progress has been made on this issue since the GOZ continues to see road maintenance as a public service and a number of revenue generating schemes are impractical for rural Zaire. The most promising approach seems to be road license fees but the issues of whether they should be imposed, who should collect them and who would control their disbursement remain to be solved.

Summary: DPP Roads & Bridges Engineering Annex

"The sub-project paper calls for 750 kms of feeder roads to be rehabilitated whereas the co-operative agreement uses the figure of 500 kms. In actuality some 700 kms were eventually affected. To accomplish this upgrading, USAID chose to carry out the following work: replacing aging ferries with bridges, and improvement of the road network by installing metal culverts at selected sites and undertaking side drainage. Nine bridge sites were selected. Six ACROW bridges and one Bailey bridge have been constructed and are now in place. Two other sites destined to receive ACROW bridging are still under construction with on-going work in preparing abutments. Some 164 culverts are already installed from the 180 called for.

The bridges observed (6) are properly constructed, properly aligned, and correctly placed on their abutment foundations. All work appears to be satisfactory in this respect. Approaches to the bridges are another story. With the type of soil at the bridge sites, these access areas or approaches to all the bridges are in need of attention. The sandy/clay type soil that has been used to construct these approaches will need to be replaced by more suitable soil such as "laterite" so that it can be properly shaped and compacted, or another solution found using the existing soil such as using a soil cement stabilization.

A discrepancy exists in the testing of concrete samples taken from material used in the construction of the abutments for the bridges. Nearly all samples had failed the compressive tests as performed by LNTP. This discrepancy cannot be resolved by visual inspection but needs to be further evaluated by an independent laboratory examining the results of the present tests and making other type of testing. It has been recommended that an independent testing laboratory be given a contract to undertake this work.

In sum, it may be stated that from the inception of this project through the various phases, i.e. project design; procurement of materials, equipment and other commodities; technical assistance provided in the studies for the structural design; delivery, assembly and launching of bridges; construction of abutments and foundations; culvert installation; and various and sundry other construction activities at and around the bridge sites; all personnel involved performed their tasks well and that overall quality of work is good."

VIII. The CECA Koda Falls Hydro Sub-Project

The primary purpose of this sub-project is construction of a 300KW hydroelectric facility at Koda Falls in order to provide electricity for the Rethy mission and Kwandrumba village. The secondary purpose is to test the economic and technical feasibility, cost effectiveness and efficiency of using a professional firm to implement the technical work. Finally, the project was to test whether a rural community hydro facility could become self-financing. A summary of the comments in the Engineering Annex on this sub-project follows.

The understandable focus on the technical requirements of constructing the facility has led to a drift away from cooperation between the Rethy Mission and the Kwandrumba community. The Koda hydro committee which the Project Paper saw as the vehicle for participation by Zairians in Kwandrumba has not met for over a year and was unilaterally replaced by an all CECA church committee. The expatriate CECA project manager has indicated his strong preference for an expatriate missionary manager of the hydro facility. The evaluators found

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significant resentment and mistrust of the missionaries among those Kwadruma leaders interviewed. Mission recommendations include an ORT facilitated joint missionary-Kwadruma meeting and resurrection of the Koda hydro committee with regular meetings until it is replaced by a hydro facility Board of Directors. Thereafter, a community Advisory Committee composed of missionaries and Zairians is recommended to maintain lines of communication.

The user fee rate structure is also addressed at some length in Annex 1. A principal conclusion is that a two tier rate structure should be examined in which Rethy residences and commercial consumers would pay a slightly higher rate to subsidize flat-rate consumers who otherwise may be unable to afford monthly charges. At present, missionaries pay 60 cents per KWH and the NRECA study suggests self-financing could be achieved at a year one rate of 11 cents per KWH. By raising this to 12.6 cents per KWH, monthly costs for poor Kwadruma residential consumers could be kept to about Z150 per month in year one. This approach was opposed by the CECA manager on the grounds that the project purpose is to demonstrate commercial economic viability, however, the evaluators conclude that this purpose may be within reach while still taking into consideration the social benefits to be gained from a two tier rate approach. This position is enhanced when it is realized that in year one 65 connections for Kwadruma flat-rate residential customers are planned while non-public (i.e. the residences, church, the academy for missionary children, etc.) Rethy consumption is estimated by NRECA in year one as 55% of total electrical output. Seeing these issues through to their resolution is another reason the evaluators recommend extending the ORT manager to December 31, 1987.

Summary: Koda Falls Engineering Annex

EXECUTIVE SUMMARY

"Construction progress was verified for the three electrical portions of the sub-project. Power plant and transformer station construction had not begun, underground cable transmission construction was almost complete, and overhead distribution network construction was about 50% complete. Other electrical supplies and equipment, with a major exception of transformers, were mostly available on site.

The quality of construction for the electrical system thus far completed was found to be good. Design specifications were being followed and accepted U.S. rural electrification construction standards were being met or exceeded. Design studies and calculations were reviewed in part only, since a thorough design review and approval had been previously completed.

Several recommendations were presented pertaining to the testing and the operation and maintenance of the completed facilities. Specific recommendations address the following points:

- o Outside technical assistance during power plant start-up and testing.
- o Purchase of high voltage cable testing and fault location equipment.
- o Provision of outdoor lighting around generation area.
- o Short-range and long-range training for those people responsible for operation and maintenance of the electrical facilities."

For details see ANNEX 3, part B.

A N N E X I

PROJECT DESIGN, MANAGEMENT AND ADMINISTRATION

Project Title: "Project Management of Private Voluntary Organization (PVO)
Economic Support"

Project Number: 660-0097

May 12, 1987

Submitted by:
Gary A. Walker, Team Leader
(Dr. Ngay Aben contributed Part V on ECZORT)

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LIST OF ACRONYMS

ACROW	ACROW bridge, amodified Bailey bridge
BETEC/DVV/ACEC	Koda Falls hydro construction contractor's association
CECA	Communauté Evangeliqué au Centre de l'Afrique
CDSS	Country Development Strategy Statement
COMBILIM	Commercial entity to support DPP
ECZ	Eglise du Christ au Zaire
ECTORT plus	Health sub-project component of ECZ ORT
GOZ	Government of Zaire
HCN	Host Country National
KW	Kilowatt
MCZ	Medecin Chef de Zone
NRECA	National Rural Electric Cooperative Association
OF	Office des Routes (GOZ)
ORT	Organization for Rehabilitation Through Training
PACD	Project Agreement Completion Date
PVO	Private Voluntary Organization
REACH	Resources for Child Health
RHZ	Rural Health Zone
SANRU	USAID Basic Rural Health Project
USAID	United States Agency for International Development (Kinshasa) Zaire (currency)

I. Introduction: Key Issues in Project Design

The Scope of Work for the Evaluation Team asks the evaluation team to determine if the project objectives as outlined in the Cooperative Agreement have been met, if planned outputs have been accomplished, and the extent to which the achievement of the objectives has contributed to the project goal and purpose.

The Team has concluded that, for the most part, the PVO Economic Support Project has been a success. Sub-project activities have contributed substantially to the project purpose of supporting self-sufficiency in basic foods (DPP) and increasing access to basic health services (ECZ and CECA).

All three project objectives have been substantially achieved. ORT effectively managed an umbrella fund in support of sub-project activities, indigenous PVOs have been upgraded as viable development agencies and PVO sub-projects have been implemented that conform to GOZ/USAID development strategies.

ORT is to be commended for exceptionally good management and administration of a multifaceted project which is both geographically and sectorally diverse. ORT was able to build important elements into the project which increased the "development quotient" of the activities. These elements are considered in sections 1.1 to 1.3 below and elsewhere in the report.

USAID is to be commended for its willingness to alter its original understanding of the project in ways which facilitated ORT's institution building strategy. USAID's concept of an "umbrella project" used to assist local PVOs and manage inputs has proved viable and successful. The basic project model can be replicated and should be used as a development tool.

As with any project, there are criticisms to be made and tasks left undone. Many of these are dealt with at some length in the remainder of this report. When reading the Team's recommendations and criticisms, it is important to keep sight of the central fact of project success and to recall the many things which could have gone wrong and did not.

The readers of this evaluation will no doubt object at certain points that the Team has perfect hindsight vision and this is so. That vision is meant to be a constructive one and one which adds perspective to the many issues which have affected the project. Finally, the reader may note some redundancy in the report since the two page Executive Summary is an abbreviated version of the fifteen page report which summarizes the annexes. This structure was mandated by USAID. If the annexes are read, the brief "report" can be dispensed with.

The remaining part of section I discusses project wide issues and focuses on ideas and aspects of project 097 which may have particular relevance for future PVO support projects.

1.1 Institution Building

The principal outputs expected from the PVO Economic Support Project were largely physical and quantifiable. For the health sub-project (ECZORT), 96% of funds were spent on commodity procurement, for the farm to market sub-project (DPP) 90% of funds were used for commodities and for the mini hydroelectric project (CECA) 58% of funds were for commodities and another 32% for the fees of the contractors' Association. (For a quantifiable summary of project outputs, see the chart on the next page).

USAID perceived the project primarily as a rapidly disbursing capital input project concerned with expending funds on schedule and for the appropriate commodities. Long term institution building was a secondary objective which was viewed by USAID as mostly a means to increase local capacity to carry out infrastructural developments. The project responded more to Congressional requirements than to USAID preferences.

Throughout the life of the project, ORT placed greater emphasis on the institutional development aspects of the project and sought to expand the scope of its involvement in this arena. More precisely, ORT defines "institution building," as a systematic program to strengthen the ability of a local institution to deliver services effectively and efficiently. Institution building within the scope of the project has included assistance in reorganizing institutions, management assistance interventions, management training and administrative development. When combined, these initiatives enhance not only long term institutional viability but the ability to become self-sustaining with respect to the provision of goods and services.

A few years ago, AID published a checklist for project designers and managers concerned with the institution building process. The checklist was derived from an evaluation of 302 AID-financed field projects with an institution building element. It is instructive to enumerate some of the key "lessons learned" as drawn from that report and compare them to the performance and priorities of ORT within the context of the PVO Support project.

On the three pages following the quantifiable outputs table, the lists and comments in column A are quoted from the AID checklist while the comments in column B refer to the Evaluation Mission's observations regarding OPT's institution building effort. The twenty most relevant items were selected from the 100 on the AID list as published in Effective Institution Building: A Guide for Project Designers and Managers, AID, March 1982.

Taken together, the chart, and the more detailed comments which appear elsewhere in this report, demonstrate that OPT has had a significant and positive impact in strengthening two of the local PVO institutions (ECZ and DPP). Shortcomings in this area - and there have been few - resulted more from overreaching than from failure to address salient issues.

QUANTIFIABLE PROJECT OUTPUTS (SUMMARY)

1. General

161	Person months of expatriate personnel time delivered, of which approximately	
-	54	Person months were technical assistance.
25	Short term technical consultancies delivered	
16	Person months of long term HCN technical assistance delivered.	
45	Person months of short term HCN technical assistance delivered.	

2. ECZORT SUB-PROJECT

220	Rural health clinics rehabilitated
\$481,000	Worth of drugs procured & delivered
\$299,880	Worth of medical equipment delivered
\$314,000	Worth of solar equipment delivered
14	RHZ regional technical coordinators trained
37	Pharmacists trained in management
69	Doctors & administrators trained in mgt.
7	Health training modules developed

3. DPP SUB-PROJECT

7	ACROW bridges installed
2	ACROW bridges to be installed by 5/31/87
164	Culverts installed
25%	Of planned side drainage completed
23	DPP staff trained in five seminars
6	Interventions leading to institutional strengthening

4. KODA HYDRO SUB-PROJECT

65%	Completion of hydro facility at 4/30/87
1	American CECA project manager trained
4	Local trainees now being trained in electricity.

COLUMN A

COLUMN B

1. Collect sufficient baseline data. Because no baseline data was collected in those communities affected by road construction, it was impossible to determine the socio-economic impact of this project component. Lack of such data makes the implementing institution less able to plan, forecast and manage.
2. Specify relevant institutional linkages. Evaluations often note weaknesses resulting from inadequate attention to the target institution's cooperative and hierarchical relations with other institutions.
3. Host country capability. More time must be allowed for implementing development efforts which rely on inexperienced host government (or private sector) institutions and host country contractors.
4. Lines of authority. Several projects suffered from misunderstandings and conflicts resulting from ill-defined relative roles of government (or other) agencies.
5. Assess the institution's capabilities. A typical evaluation comment: "Project design was over ambitious in light of the institution's capabilities. This is one of the reasons the project has earned a negative image at the institution."
6. Check local availability and explore the limits of local expertise. Local staff on the project team or in host institutions are critical to institution building efforts. Be certain they are used and not used in appropriate ways and times.

Insufficient baseline data collected for the Koda project before implementation began (socio-economic baseline survey completed only in 12/86 and NRECA survey in 4/85); adequate baseline data was available to locate bridges and culverts at economically sound sites; ECZORT data available through on-going ECZ and SANRU activities.

ORT was excellent in development of DPP-COMBILIM and in developing smooth ECZORT-SANRU relations; ORT should have given more attention to CECA's relationship to the Kwadrumba community and the Koda hydro committee.

The timing of ORT interventions has generally been sound even though the pace has sometimes been at the ability to absorb interventions (e.g. DPP reorganization); CECA project delays could not have been fully anticipated.

Lines of authority were generally clear between ORT/Kinshasa and the sub-projects, however, ORT sometimes suffered problems in this area between its London, New York, Washington and Kinshasa offices.

Institutional capability assessments were carried out by ORT as a prelude to management and management training interventions. As a result, ORT has a most positive image at ECZ and DPP. CECA was already known to be able to oversee the Koda hydro project.

ORT hired a local management training specialist and used local consultants in some areas. ORT may have been able to make greater use of long term local hire personnel in management training and health interventions and should stress the need for this with CECA.

7. Provide for the effects of inflation. Inflation is the external economic factor which affects most project designs. Many evaluations refer to inflation, citing its raising of construction costs and wages, and the havoc it plays with budgeted financial inputs and program effectiveness.
 8. Set commodity prices at realistic levels and assure compability of equipment. The success of the public works element of some institution building projects has been determined by this factor. Use of U.S.-manufactured machinery has caused problems on several projects.
 9. Set realistic staffing levels. In an effort to cut contractor management costs, some projects called for recruitment of impossibly multi-skilled advisors or had too few advisors to implement the time-consuming institution building activities required by the projects.
 10. Insist on local language fluency. In francophone Africa several evaluations deplore the absence of this skill and its deleterious effects on project implementation.
 11. Anticipate management problems. Target institution weaknesses in management, organization and administration are frequent foci of critical evaluation reports statements.
 12. Focus on target institution executives who exhibit leadership ability. The influence of outstanding individuals when they were in charge is significant for institution building.
- Inflation did not much affect the dollar account since inflation in the U.S. has been low, however, the value of local currency, the Zaire, has plunged from 5.8 to 110 to the dollar since this project was in the design phase. Since Zaires are obtained through sale of PL480 commodities, the availability of Zaires has increased but so have costs.
- No major problems were found of incompatible equipment being ordered or of the prices for needed commodities being underbudgeted. ECZ in particular has praised ORT's commodity procurement. There have been some problems caused by U.S. procurement.
- Staffing levels were realistic given the amount of project management required by three different sub-projects in widely dispersed areas, their distinct needs and the amount of institution building ORT staff was able to supply. Whether as many expatriates were needed as were used is discussed in part II below.
- ORT is to be congratulated for recruiting staff with good language skills. The project manager, health coordinator and management specialist are fluent in French.
- This was a particular strength of the ORT management team. A steady and careful approach to identifying management weaknesses and a systematic approach to addressing them has been a project success.
- In the case of DPP both the director of DPP and COMBILIM attended the training seminars; the CECA project manager was sent to the U.S. for training (See Annex 2); considerable health training was also completed with key personnel.

13. Indigenization is the aim of institution-building projects. A criticism of several projects is the lack of progress in finding and training host country nationals for key positions.
14. Provide for legal transformation where necessary and have counsel check the country's laws.
15. Analyze the target institution's grassroots support. Some projects have tried to strengthen institutions which have later been found to have earned widespread antipathy.
16. Insist on adequate pre-construction economic studies.
17. Communications. Ability of the contractor's chief of party and staff to communicate and work closely with host country nationals is cited in over two dozen AID evaluations as critical to the success of institution building projects.
18. Commodity inputs. Late procurement and arrival is frequently cited as undermining institution building project goals.
19. Late arrival of contractor personnel. The complaints are widespread and persistent in AID evaluations since this factor can undermine projects in many ways.
20. Financial obligations. Poor financial management or delayed disbursements were cited by many evaluation reports as leading to erosion of host country institution confidence in both the financial and overall capabilities of the project team supposed to be assisting them in institutional strengthening.
- DPP and COMBILIM are already entirely operated by Zairians (with one exception); ECZ is largely staffed by Zairians; CECA is officially an indigenous PVO and it has a Zairian head in its Bunia office, however, CECA/Rethy is entirely composed of Americans.
- Appropriate legal counsel is being provided to assist CECA set up a satisfactory legal framework for the Koda hydro facility.
- DPP and ECZ are longstanding organizations in Zaire with strong links to their communities; CECA at Rethy needs to strengthen its relations with the Zairian community.
- Inadequate at CECA; satisfactory for DPP and ECZORT sub-projects.
- ORT had no serious problems in this area although some staff were stronger in inter-personal skills than others.
- ORT had some difficulties in co-ordinating procurement among its international offices and keeping its service up to standard.
- The Cooperative Agreement was concluded on 9/30/83 and the project manager arrived at post 3/16/84. A TDY director covered from 11/83 to 3/84 but performance was poor.
- ORT's accounts are in order and both the Mid-Term Evaluation and USAID have expressed satisfaction with ORT's performance in this area. There were delays and errors in provision of financial data to the field from ORT/London via Washington but this was solved by a personnel change in London.

A few typical comments made to the Evaluation Team at ECZORT and at DPP regarding ORT's impact on institutional development follow:

"The ORT input may have doubled the efficiency of the SANRU project through the efficient introduction of management and administrative procedures. Procurement by ORT was more rapid than AID's and, taken together, made a tremendous difference to our ability to function and reach our goals." Steve Brewster, ECZORT Technical Coordinator (April 17, 1987).

"It was a real blessing to have ORT here for the past three years. We had become an overly large and not very efficient administrative bureaucracy and ORT showed us many useful ways to streamline our operation. Even with our poor salaries, this has motivated us to carry on." Abne Phulushi, DPP Executive Coordinator (April 21, 1987).

In the case of CECA, much less institution building was required since the CECA mission has existed for over 60 years and is able to draw on the skills of its resident American missionary community. Further, less training was needed since there will be little or nothing for local Koda hydro staff to do in the absence of a functional hydroelectric facility. ORT correctly focused nearly all its energies in this sub-project on an attempt to lessen the serious delays caused by the contractor's Association.

Probably the major error in this sub-project from the perspective of institution building (assuming some indigenization is a major goal) was the decision to send the CECA project manager (Paul Brown) to the U.S. for ten weeks of training on the understanding that he would return to Rechy and teach his new skills to Zairians. ORT did not exhaust the possibilities of identifying a Zairian to receive the training before agreeing to send Mr. Brown. ORT seems to have responded to pressure from CECA to select Mr. Brown as the most efficient course of action and Mr. Brown did not inform ORT before his training program that he would be leaving Rechy in July, 1987 for twelve months. During an interview with Mr. Brown, it was learned that he has transferred, by his own estimate, only about 15% of the material learned in the U.S. to Zairians. As noted in Annex 2, even this training was sporadic and informal. The ORT project manager stated that, had he known of Mr. Brown's plans for a year's leave during the critical July, 1987-July, 1988 period, he would not have agreed to send him to the U.S. for training in lieu of a Zairian. The effect of this situation on the sub-project is considered in Annex 2 and in part VII below.

The following table summarizes the principal institution building interventions undertaken by ORT. In each instance, the goal was to build these interventions directly into the design of each sub-project.

INSTITUTION BUILDING INTERVENTIONS

SUB-PROJECT: ECZORT RURAL HEALTH

Interventions occurred at the RHZ level, regional technical support level and at ECZ's Kinshasa office. They included:

1. Management Training Modules. Seven training modules and guides developed in: human resources, financial mgt. equipment and material mgt., drug mgt., introduction to primary health care, planning, and evaluation. CRT also:

a) Conducted a RHZ management needs assessment using a questionnaire developed through a consultancy with Technoserve. It was published in February, 1986;

b) Two National Workshops were held (March 17-April 9, 1986 and October 6-November 22, 1986) These were multi-donor and GOZ Department of Health efforts which were led and managed by CRT personnel. Forty-six doctors and administrators from 21 RHZs were trained in the first workshop and 23 in the second.

c) Five local consultants field tested, evaluated and revised the manuals in five RHZs to ensure internal consistency and conformity with overall institutional goals and procedures.

2. Pharmacist Training. CRT financed and managed two regional drug management workshops for RHZ pharmacists and developed a simplified training module for lower level personnel. This is now being used by SANRU and the Dept. of Public Health.

3. Regional Technical Coordinator's Training. Two national level workshops were held for regional coordinators who are responsible for support of ECZ activities throughout Zaire.

SUB-PROJECT: DPP ROADS & BRIDGES

1. Organizational needs assessment. Included legal, financial and institutional analyses.

2. Diagnosis of management dysfunctions and training needs assessment.

3. Facilitation workshops on organizational restructuring.

4. Financial reorganization. A Technoserve consultancy redesigned accounting systems and procedures.

5. Management training. Five training modules prepared.

SUB-PROJECT: CECA KODA FALLS HYDRO PROJECT

1. Institutional development assistance. NRECA consultancies to develop structure and user fees for the hydro facility.

2. Legal Assistance. U.S. law firm provided to draft legal documents required by GOZ and USAID to set up facility.

As demonstrated above, ORT has had an important, positive impact on the institutional capabilities of two of the local PVOs with which it had sub-projects. This impact will have consequences for other AID projects which are planning to work with DPP such as the 098 roads project and the planned Area Food and Market Development project (no. 102). In this regard, the recommendation in section 6.7 for more management training and management support for DPP over the remaining four months of this project is of particular urgency.

1.2 Sustaining Project Objectives

Institution building is one means of sustaining the project's objectives over the long term. Another is by promoting self-financing mechanisms and preventing dependency on external donor institutions. Yet "sustainability" has a third element beyond self-financing and beyond efficient institutionalized management and administration; that is the quality of innovation and creativity. This quality cannot entirely be learned since it involves cultural norms and concepts of leadership and risk taking, however, management structures can be set up which encourage or stifle these qualities.

Each of the three sub-projects contained a self-financing aspect as follows.

The ECZORT rural health sub-project.

The basic self-financing concept rests on the assumption that an initial stock of medicines can be sold to consumers at a rate which will permit the rural clinics to re-stock medicines with the user fees collected. The use of solar panels to generate electricity was seen as a low cost method of preserving the cold chain for vaccines and certain medicines. The rehabilitation of clinics was seen as a way to encourage local dispensers and give users a sense of a new beginning. This, in turn, was to boost confidence and acceptability of the clinics. Section 4.5 considers this issue at greater length.

The DPP roads to market sub-project

The self-financing concept centered on user fees for those on the roads and bridges of the project zone. Several options have been explored from road permits to bridge tolls but no feasible approach has yet been found in view of the GOZ's position that roads are a public service. Private maintenance by some commercial ventures who use the roads occurs but Zaire is very far from devising a self-financing road maintenance system.

The CECA Koda Falls hydro sub-project

Self-financing is probably most feasible for this sub-project since there is a core group of consumers able and willing to pay for the service and costs can be easily measured and controlled. Consultants are currently developing rate schedules to cover operating costs, amortization and a development fund (serving as a fictive loan repayment to demonstrate long term commercial viability of similar mini hydro schemes).

The "third element" of sustainability - innovation and creativity - is the least tangible and, therefore, the most difficult to assess. It involves establishing an environment where motivation of staff is high, where new ideas and techniques are rewarded and where efficiency is praised. To some extent, staff can learn to think creatively if they are provided with regular learning opportunities in non-traditional (i.e. not classroom lectures) environments.

The ORT team was aware of this element of project sustainability and sought to motivate trainees as well as instruct them, sought to use role playing and gaming to gain the active involvement of staff in training seminars and sought to work with supervisory staff to encourage them to look for and reward those who come forward with solutions (organizational or technical) to institutional problems. This awareness and effort is apparent in the training reports prepared by ORT staff and in the positive reactions their training efforts produced from DPP and ECZ staff.

On the whole, therefore, ORT was most successful in terms of project sustainability in terms of (a) delivery of commodities which help increase the net assets of the local PVOs, (b) institution building through training and technical interventions and (c) working to make the hydro scheme self-financing. Some success was achieved in the self-financing of rural health centers and some contribution was made in the "third element" of stimulating innovation and leadership. No progress was made in self-financing of roads and bridges.

One of the difficulties in the sustainability concept is the question of recurrent costs. In the case of the PVO Support project, the issue is most readily apparent in the ECZORT sub-project where, once medicines and equipment are provided to a rural clinic or health zone, it is expected that sustainability can be achieved through the sale of the medicines to local users with the funds being adequate to re-stock and pay local salaries. In reality, inflation and the continuing deterioration in the value of Zaire's currency plus breakage, theft and loss make re-supply at the same level quite difficult.

For future projects, USAID may wish to consider using counterpart funds as a recurrent cost cushion for, say, three years after the end of the project. For example, in year one the health centers might receive a fifty percent subsidy to supplement their user-generated revenues, in year two that amount might fall to 30% and in year three to 15%. This might help to stabilize the system and give the clinics more time to adjust their system and services to local realities.

1.3 Replicability of the Project Design

The Scope of Work has asked the Evaluation Team to determine if the PVO Support Project can be used as a model for the design of future PVO projects in Zaire and to make recommendations for such a design based upon specific successes and failures of the project being evaluated. As mentioned above, the Mission has concluded that the design, with modifications to be discussed below, is replicable and should be used as a point of departure for future assistance to PVOs in Zaire.(1)

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The following is both a discussion and series of recommendations which draws upon the lessons from the PVO Support Project and from other, similar projects in other countries. To maintain coherence, this section has been divided into nine parts as follows:

- 1) purpose of PVO assistance projects;
- 2) structure of the design;
- 3) function of the umbrella PVO;
- 4) criteria for selection of an umbrella PVO;
- 5) cost effective innovations;
- 6) indigenization, a goal and a necessity;
- 7) criteria for selection of sub-projects;
- 8) criteria for selection of local PVOs;
- 9) relationship to USAID.

1.3.1 Purpose of PVO Assistance Projects

The purpose of project 097 was stated in the Cooperative Agreement as follows: "to support ...self sufficiency in basic foods and provide access to basic health services to the rural population of Zaire." One of the three objectives of the project was listed as "upgrading indigenous PVOs as viable development agencies." The purpose of PVO assistance projects should be to "assist PVOs." In other words, the second project objective should rather be the project purpose since it is through the PVO that objectives such as increasing food production will or will not be achieved.

This is more than an academic distinction because it reorients the entire conception of a PVO project away from what are essentially ends (more food, better health) and focuses on the means (development of viable PVOs as development institutions) to attain those ends. By strengthening the means and by ensuring that the PVOs in question are genuinely indigenous, one provides Zairians with the tools to undertake their own development and trains Zairians in the efficient use of those tools and how to make new tools. In short, if the means (viable PVOs) become the ends (project purpose), then the goals of improved human well-being will be generated and sustained from the efforts and ingenuity of the Zairian people.

(1) This conclusion is reinforced by the World Bank which recently concluded that "the activities of the locally based groups (through PVOs) would increase accountability and result in more relevant, better - planned programs that are less costly to put in place and maintain (than) slow moving public programs". Zaire Economic Memorandum May 1985, Report No. 5417-ZR provides Zairians with the tools to undertake their own development and trains Zairians in the efficient use of those tools and how to make new tools. In short, if the means (viable PVOs) become the ends (project purpose), then the goals of improved human well-being will be generated and sustained from the efforts and ingenuity of the Zairian people.

1.3.2 Structure of the Design

The details of the project design should be left to the project design team, however, the structure should strive for simplicity and promote collegiality among local PVOs and between local PVOs and the umbrella group. The design should maintain flexibility for umbrella group staff to be innovative in their approaches to sub-project activities while also being able to adjust their budgets in response to changing needs. As mentioned below, Zairians should be involved fully in designing the project.

USAID is increasingly using the PVO umbrella approach as the foundation for project design in several countries (e.g. Chad, Somalia, Senegal, Haiti). When designing a new PVO support project for Zaire, the structure and experience of these projects should be considered.

In particular, the following design issues should be addressed:

- o legal relationship between the umbrella and sub-grantees;
- o compatibility of internal procedures;
- o issues of varying levels of local salaries and benefits;
- o authority structure (hierarchical relationships and respective areas of responsibility and innovation);
- o degree of sub-grantee budget line flexibility;
- o legal liability for injury or death.

1.3.3 Function of the Umbrella PVO

The primary function of the umbrella PVO would be to act as a development resource and management unit for local PVOs, a place where sub-project design and budgeting assistance can be obtained, where management guidance and institution building interventions can be devised, where local PVOs can bring their ideas and find help in translating them into solid development proposals which may then be suitable for funding. In addition, the umbrella PVO would monitor sub-project implementation, design financial management and reporting systems, participate in evaluations of sub-projects, sign the sub-project agreements and maintain USAID sectoral and geographic priorities. It would stimulate indigenization, recommend and possibly organize and deliver technical and management training and build upon some of the management development successes of project 097.

1.3.4 Criteria for Selection of an Umbrella PVO

The following criteria are among those the Team would include for selection of an umbrella PVO:

- o select a PVO which is already familiar with Zaire (e.g. Technoserve, ORT, Appropriate Technology International);

- o select a PVO based partly upon USAID's prior experience with the PVO in Zaire but pay special attention to the quality of personnel available proposed by the PVO. Good prior experience is meaningless if proposed personnel are not up to the management and development tasks of the project.

1.3.5 Cost Effective Innovations

The single greatest cost to most projects is expatriate support (salaries, housing, airfares, benefits, furniture, education allowances, etc.). Any project, and especially one working with local PVOs, should examine closely whether the assistance to be rendered by an expatriate is worth the FULL cost of recruitment and maintenance.

USAID might consider (a) specifying positions to be filled by host country nationals and requiring bidders to submit the resumes of HCNs in their proposals, (b) placing a cap on total expatriate support costs that will be accepted as responsive to a RFP (either a percentage of the total proposed budget or an absolute dollar figure) and specifying what budget line items constitute expatriate support or (c) placing a cap on total management costs as a percent of the total budget and, again, defining management costs by line item.

In the PVO Support Project, for example, USAID might have stipulated that the health coordinator and management specialist positions be filled by HCNs and capped management costs at 18% of the total budget while defining fixed percentages of time of the long term personnel which would be considered as technical assistance as opposed to project monitoring time. This would have compelled restructuring of the project but without, the Mission believes, any diminution in project effectiveness.

1.3.6 Indigenization, a Goal and a Necessity

How does one build a project which becomes rooted in a local culture and local community such that it ceases to be or to be thought of as a "project"? How does a project become internalized as part of the web of local practices and capabilities? How can a project be designed so that this potential is inherent in the design and so that the potential is eventually realized?

A project will evolve into the ongoing activities of the local milieu if it is designed to promote and ensure the eventual indigenization of project activities. Let us take again the examples of DPP and CECA/Rethy. DPP has development as its primary purpose and it works with COMBILIM to sustain its development objectives financially. A complementarity and outreach to Zairian villagers is evident between the commercialization of COMBILIM and the extension, training and community development of DPP.

At CECA/Rethy, after sixty years, the center clearly has evangelization as its primary purpose and remains an expatriate center living its own life and providing health care services to the neighboring Zairian communities. The value of the health care is not in dispute. The lack of commitment to indigenization that was so clearly evident there means that the Koda hydro facility will probably not become a Zairian facility but will remain "the American missionaries' electricity system built by the American government which will also benefit some Zairians." While the Koda Falls hydro facility may have been worthwhile for other reasons, it should not set a model for future PVO assistance if the definition of the purpose of PVO assistance, outlined above, is accepted.

For a project to be so designed that it eventually ceases to be "a project," Zairian input should be assured in the project design. A joint design team of Zairians and Americans fluent in French should examine together the questions of PVO institution building, sustainability and "enracinement". Zairians should be equal partners in the design effort whose perspectives are valued and whose superior knowledge of local conditions is acknowledged.

Finally, the project design should have contained in it a plan for Zairianization at a pace and at levels which will be consistent with Zairian capabilities and reflective of planned training opportunities for Zairians connected to the project.

1.3.7 Criteria for Selection of Sub-Projects

The following criteria are among those the Team believes USAID should apply when considering, or having an umbrella PVO consider, financing sub-projects or sub-activities:

- o focus on projects which strengthen institutions and do not merely deliver commodities;
- o focus on projects which address institutional problems globally and do not confine themselves to support of a "unit" or "division" within a larger institution. The part cannot ultimately stand without the whole.
- o focus on projects which avoid creating donor dependency and have a specific timetable and detailed, realistic plans for achieving self-financing status.
- o focus on projects which conceive of sustainability not as an "activity" (e.g. road building) but as the function of the entity building the roads.
- o focus on projects which can become self-sustaining AND are capable of growth. A project may eventually create a condition of replenishment (e.g. ECZORT clinics, possibly) but may be using all its energies to avoid slipping back to the previous state (i.e. having each re-supply of drugs be somewhat less

than the last as inflation erodes self-financing). Income generating projects as adjuncts to the ECZORT effort, for example, might have combined to generate the extra revenues villages will need in the future to maintain the availability of basic health care.

An example might be to station a Peace Corps Volunteer or U.N. volunteer in a village in Bas Zaire who would work as an "animateur" attached to SANRU with the objective of helping villagers plan and carry out income generating activities in a number of nearby villages. A community vegetable garden with the proceeds going to the clinic, a local bee keeping operation, etc. might be considered.

- o focus on projects with genuine local roots. The difference between DPP and CECA was stark. At DPP the Evaluation Mission spoke to over a dozen Zairians in responsible positions while at CECA/Rethy the PVO was entirely expatriate. The CECA/Rethy mission mostly provides services to Zairians whereas at DPP, Zairians are building their own institution, defining their own priorities and working in the local villages where their friends and families live.
- o focus on projects which can localize their assistance and have a grassroots, village network to build on so that their management and technical expertise can be shared with the lowest units of social and economic organization.
- o continue to focus on USAID's priority sectors. They make sense and offer considerable scope for creative activities within the criteria outlined above.

1.3.8 Criteria for Selection of Local PVOs

Among the criteria to be used for selection of local PVOs, the Evaluation Team believes the following to be most important:

- o focus on local PVOs which are or have the potential to become predominantly Zairian in character;
- o focus on PVOs which have a primary commitment to development and do not view development as merely a means to other ends;
- o focus on PVOs with credibility and village level networks in their areas of operation;

- o focus on PVOs which have demonstrated their capabilities in the past, but remain open to newly formed PVOs;
- o focus on PVOs which are willing to work with other local PVOs in a spirit of cooperation toward meeting common development objectives and avoid PVOs which hold religious biases against other religiously based groups which are strong enough to make cooperation difficult if not impossible ;
- o focus on PVOs with strong and dynamic leadership and a willingness to innovate;
- o when local PVOs are led by expatriates, take time to explore their ideas of development and their attitudes toward Zairians. See if they speak a local language, if they have personal friends who are Zairian, if they socialize with Zairians as equals. While these criteria may seem far from central to the selection of a PVO for some, the Mission believes they are crucial to ensuring long term viability for projects and to ensuring that the potential for Zairianization is present.
- o when local PVOs are led by Zairians, take time to explore their ideas of development and their attitudes toward their fellow Zairians. Ensure that those leading the PVO are respected in their community as persons of integrity and commitment.

1.3.9 Relationship to USAID

There are several advantages to USAID in establishing an umbrella PVO project, including:

- o the use of PVOs is popular with Congress;
- o PVOs are normally less expensive than contractors; (1)
- o an umbrella PVO with an American Chief of Party and mostly Zairian technical and support staff would be even less expensive;
- o an umbrella project will reduce the management burden on USAID and allow AID to set up a "mini-USAID" to handle a number of worthy but small scale projects;
- o an umbrella project might also group some non-PVO activities such as Peace Corps affiliated projects;
- o the PVO approach is consistent with USAID's overall objectives as stated in the CDSS:

(1) The USAID office could, in a few days, determine how much less expensive PVOs are compared to contractors by reviewing a sample of say, six Cooperative Agreements and six contracts. Items to be reviewed include: (1) overhead and G & A rates; (2) comparative overhead pools; (3) the items on which overhead is taken; (4) comparative cost of management; (5) presence of fees (including "hidden" PVO fees); (6) average cost of short-term consultants, etc. From ten years of working with contracts and knowing their cost and rates compared to PVOs, the team leader is satisfied that such an analysis will demonstrate that PVOs are significantly less costly. Such an analysis, of course, must then be used in conjunction with comparative quality assessment.

II. Project Personnel

2.1 Appropriateness of Staffing Pattern

Like the project itself, the staffing pattern emerged in response to the changing needs and priorities of the project. It also suffered from staff turnover caused by differences of opinion between ORT/London and the ORT/Kinshasa project manager regarding the mix of positions and skills needed to implement the project.

Over the three year period March 1984 - March 1987:

- o The first Admin./Finance director left after six months and the second left after eight months after which these functions were carried out by the office manager and project manager.
- o The person proposed by ORT/London to oversee implementation of the DPP project left after nine months and was replaced by a project engineer. The first person was a roads consultant who was most helpful in preparing the project proposal since he knew the region well whereas the second person was an engineer able to monitor the construction.
- o Since the Admin/Finance person was not retained, the project then recruited a management specialist to conduct some of the training originally envisaged for the Admin/Finance person.
- o To support the ECZORT sub-project, a Technical Coordinator was hired and worked within ECZ and a health training coordinator was brought on to assist with health management and procurement.
- o The project manager remained with the project from his initial employment on March 16, 1984 to the present.

While there are explanations for each staff movement, taken together, one of the five staff recruited by ORT/London remained with the project to completion, Fox, and four did not (Arad, Moens, Cahen and Goder). None of the four were Americans. The three staff recruited by the project manager (Brewster, Dehasse and Emrich) remained with the project to the end of their contracts and all were Americans. In addition, the project recruited one Zairian trainer (Tabaro) who has remained with the project.

Leaving aside the detailed reasons for the various personnel changes which are by now of little interest, it should be noted that some of the cause of these difficulties appears rooted in the fact that the project manager was hired in Kenya and was brought directly to Kinshasa to take over the project without any orientation at ORT's London, New York or Washington offices. The project manager had never worked for ORT before and made his first trip to London six months after starting work and six months after a number of management and personnel difficulties began to emerge. Had the project manager been thoroughly briefed at ORT headquarters before beginning work and had a personal relationship been established with the home office project staff, at least some of the project's initial difficulties would have been lessened significantly.

2.1.1 Long Term Positions

One issue raised in connection with the overall management cost of the project is whether some of the positions filled by expatriates could have been filled as well and at less cost by host country nationals (HCNs). After interviewing all available remaining ORT staff in Kinshasa and comparing the position descriptions of various posts to the types of locally available skilled personnel, the Mission has concluded:

a) that the health coordinator's position could have been filled by a host country national at less cost and, with the right person, with similar results. In fairness, it should be noted that the health coordinator position was a junior one paying only \$18,000 per annum. Since a HCN would have been paid in counterpart funds, this entire salary over the 25 months the position existed could have represented a savings of about \$33,000.

b) that the management specialist's position could also have been filled by a host country national. The saving in salary over the 16 months would have amounted to about \$47,000.

Considerably more would have been saved in counterpart funds since house rent for these two positions was running about 260,000 per month each in 1985 and 265,000 per month in 1986. For the combined 41 months, this totals 22,580,000 or (very approximately given rapidly changing exchange rates) \$50,000. The current long term Zairian ORT employee (a university graduate with good skills) is earning 2260,000 per annum as of April, 1987, including all benefits. Even assuming a higher rate for two HCNs hired to fulfill the health and management positions (say 2300,000 per annum each), their combined salaries would have yielded a net counterpart fund savings of 21,555,000 or about 60% of the funds spent on house rents. The estimated dollar equivalent is \$30,000 saved.

To summarize, ORT could have hired two Zairians and saved the project at least 1110,000 (\$30,000 in rent plus \$80,000 in salaries.)

The Team concurs in the project manager's judgment that the health coordinator and management specialist positions were needed, or at least that the tasks performed by those occupying these two positions were necessary and supportive of the project's objectives. It is certainly possible that, had a HCN been recruited for either or both of these positions, the quality of work may have suffered if an inappropriate individual had been selected. On the other hand, this very result seems to have been the case in some of the expatriate hirings made by ORT/London. The point is that a prima facie case cannot be made for hiring either a HCN or an expatriate since their respective qualifications are or should be the determining factor. The project could have made a greater effort to identify qualified HCNs for these positions and reprogrammed the saved funds into other needed areas.

This issue was discussed at length with the project manager who claims that those filling these positions should have been Americans since it is a U.S. funded project and that they should be able to speak English. Leaving aside the fact that there are at least a few American educated and English-speaking Zairians, the Mission does not agree that nationality and English language ability were of paramount importance. First, all individuals with whom the health coordinator and management specialist had to work spoke French and, second, none of the four ORT professional staff sent from ORT/London were U.S. citizens. While the project manager may have considered nationality an important factor, clearly his organization did not.

The original project design included the post of Procurement Specialist which USAID stated it later removed as unnecessary. The issue of procurement and the amount of personnel time required to prepare procurement requests and obtain exonerations is discussed in part 3.4 below. CRT hired a HCN to facilitate exonerations but some of this work, plus obtaining procurement specifications, fell to expatriate staff. The project manager asserts that the cost of a full-time procurement specialist could not have been justified in terms of the tasks to be undertaken in country since much of the development of procurement lists was carried out within the sub-projects while identification of suppliers was the responsibility of ORT/London and New York.

Once shipments arrived in Zaire, most tasks were logistical in nature and probably did not require the services of a full-time procurement specialist. As indicated in 3.4.3 below, the project could have used assistance in obtaining exonerations and arranging onward forwarding of commodities within Zaire. The Mission has no independent information which would lead us to question USAID's decision to remove this post and the ORT manager's decision not to request its reinstatement.

Regarding the question of whether the presence of a procurement specialist would have freed up staff for more field visits, the Mission concludes that this is doubtful. It appears that, at least some of the time, procurement problems may have been a convenient excuse to not do something which some of the team preferred to avoid. A HCN exonerations specialist may have been more effective lessening staff time which was spent in this area.

Finally, USAID requested the Mission to consider whether the use of more short term staff in place of the long term health and management specialists would have been more cost effective. The Mission concludes that the continuity gained through long term personnel is more important than any savings that might have been obtained, particularly if the Mission's recommendation on the use of HCNs was to have been followed.

2.1.2 Short Term Positions

Approximately twenty-five short term consultants were employed during the life of the project. Most were hired locally and paid with counterpart funds. The project manager asserted, correctly we believe, that ORT performed a considerable service by identifying who locally was able to do what types of management training. This information should be provided to AID to facilitate their own use of local consultants and to provide local consultants for other AID projects.

ORT/London is to be congratulated for decentralizing its decisionmaking regarding the employment of local consultants. The ORT project manager was able to identify consultants, draw up their scopes of work, hire and pay them under his own authority. Information about who was to be hired and for what purpose was transmitted in regular monthly reports both to ORT and AID.

Overall, the judicious and timely use of local consultants has been a strong point of project performance and a review of a number of consultant reports shows them generally to be of a good quality.

2.2 Evaluation of Personnel Performance

Only those long term personnel who have worked on the project since January 1, 1986 are considered since information on other former employees is too incomplete to bear comment.

1) Steve Brewster, Technical Coordinator

Mr. Brewster has a good reputation among those in ECZ with whom the Mission spoke and his work was praised by the project manager. His working relationship with Zairians seems excellent. He is a former Peace Corps volunteer in Zaire.

2) Jean M. Dehasse, Management Specialist

Ms. Dehasse received positive comments from her professional colleagues at the ORT office and from DPP persons interviewed.

3) Laurie Emrich, Health Coordinator

The project manager, ECZORT personnel and other ORT staff all praised her work as outstanding.

4) Leslie Fox, Project Manager

The Evaluation Mission has concluded that Mr. Fox has overall done

6) Tabaro Tchim, Management Trainer

The project manager, DPP and ECZ staff all praised Cit. Tabaro's professionalism, competence and effective training style. During the Team's extensive contact with Cit. Tabaro, he was observed to be well informed and capable.

2.3 Conclusions and Recommendations

Despite a rocky start and several personnel changes, an effective team was eventually put in place that was able to implement the project's objectives. The Team, in conclusion:

RECOMMENDS THAT ORT NEVER SEND A NEW PROJECT MANAGER TO A FIELD POST WITHOUT DETAILED HOME OFFICE BRIEFING AND ORIENTATION EVEN IF THERE IS ALREADY ANOTHER STAFF MEMBER AT THE DUTY STATION.

RECOMMENDS THAT ORT ESTABLISH A POLICY AT THE BEGINNING OF A PROJECT REGARDING THE NATIONALITY OF PROJECT PERSONNEL. HIRING OR NOT HIRING HCNs CAN BE A SENSITIVE ISSUE FOR A PROJECT MANAGER. A CLEAR POLICY MAKES DECISIONS IN THIS REGARD MORE DEFENSIBLE TO LOCAL STAFF AND PROVIDES GUIDANCE TO THE PROJECT MANAGER REGARDING HOME OFFICE VIEWS AND PREFERENCES IN HCN EMPLOYMENT.

RECOMMENDS THAT ORT DEVELOP A PROJECT SPECIFIC FIELD MANUAL WITH CERTAIN STANDARD FEATURES COMMON TO ALL ORT PROJECTS BUT WITH EMPHASIS ON POLICIES AND PROCEDURES WHICH ARE SPECIFIC OR UNIQUE TO A GIVEN PROJECT.

III. Project Management by ORT

3.1 Home Office Backstopping

To begin, ORT's multiple offices in London, New York and Washington, D.C. made it sometimes difficult to know which office constituted the home office for what. Salaries and benefits were paid out of New York for American employees and London for non-Americans, procurement was largely undertaken in New York and, later, Washington with documents initially going first to London and, later, direct contact was established with New York and Washington. Budgeting and budget modifications were handled by London while evaluation involved London and Washington. Most backstopping seems to have been provided by London with procurement being mostly a New York responsibility.

While the ORT project manager was critical of the backstopping he received (or did not receive) from ORT/London, one is inclined to suspect that there are two (or rather, four) perspectives involved. The Evaluation Mission is not able to interview ORT staff in London, New York and Washington. Consequently, the Mission is not in a position to analyze or comment upon the institutional difficulties ORT may have experienced in communicating among its various offices.

A key difficulty in backstopping this project should probably be ascribed to the manner in which the project was created. As noted elsewhere, USAID wanted to obligate \$5,000,000 in ESF funds before the end of FY 1983. ORT was asked to prepare an unsolicited proposal urgently. A brief paper was written setting out AID's notions of how it wanted to spend the funds. On this basis, a Cooperative Agreement was signed with the understanding that "details would be worked out later." ORT then brought its new project manager on board as a first time ORT employee and sent him directly to Kinshasa with no orientation to ORT or the project. That no doubt made the project manager's task more difficult and uncertain.

A week to ten days in March, 1984 to set up communication systems, agree on financial reporting requirements, engage in a dialogue about the project's purposes and potential for contributing to long term development goals in Zaire and the degree of autonomy, authority and responsibility of the project manager vis a vis ORT headquarters and USAID would have greatly lessened the frustration level and provided needed guidance. On the other hand, the impatience and overreaction of the project manager on a number of occasions unnecessarily strained relations between ORT/Kinshasa and ORT headquarters as well as between USAID and ORT/Kinshasa.

3.2 ORT/Kinshasa

3.2.1 Policy Development, Planning and Implementation

The Evaluation Team mission has been favorably impressed with the overall planning, policy development and implementation effort of the ORT/Kinshasa office. The project manager has a sound grasp of development concepts and is committed to rooting project achievements into local institutions so as to ensure that project activities have long lasting effects in the key areas of institution building and sustainability. His recruitment of others (Emrich, Dehasse and Tabaro) who share this view of development served to build a coherent and consistent approach to technical management interventions in sub-grantee organizations.

Evaluations tend to take for granted what was done correctly and to highlight shortcomings. It may be useful to enumerate briefly things which could have gone wrong and did not. The fact that these issues do NOT feature in the Team's concerns is a compliment to ORT's planning and management of this project.

o the project did NOT fail to stress indigenization as evidenced by its training at the sub-project level in ECZORT and DPP. Additional indigenization could have benefitted the project in the training area for Koda and within the ORT office. The Team notes ORT's success in recruiting Cit. Tabaro as an ORT staff member as an indigenization effort.

- o the project did NOT fail to plan in such a way that linkages were created to facilitate the transfer of skills to local people in most areas;
- o the project did NOT fail to notice institutional weaknesses and address them in a coherent and planned manner;
- o the project was NOT constrained by inadequate project planning or insufficient staff;
- o the project will NOT end in a manner that important data and lessons learned about working with local PVOs will be lost thanks to the care with which records have been maintained.

The project management was also able to build trust and confidence between the ORT staff and sub-project personnel over time. Initially, some sub-project personnel saw ORT as nothing more than a retail store with no prices attached to the goods. The caution and sense that ORT was "interfering" in their organizations slowly yielded to a recognition of the contribution ORT could and did make to strengthening their institutions in ways which were equally, if not more important, than the commodities received. Interviews with ORT, DPP and ECZORT staff have confirmed this transition in outlook and the positive consequences for the project. During the first year, for example, ECZORT did not want ORT personnel to visit clinics without an ECZ representative being present and DPP, at first, resisted suggestions that it suffered from weak management capability. By the end of the project, all staff interviewed from both organizations praised the contribution ORT made to their institutions. This transition can be attributed in large measure to the steady, planned application of good management and good communication skills to a set of project objectives that were eventually realized.

Perhaps the major difficulty in this arena was ORT's attempt to manage the Koda project and ensure that the CECA project manager did not exceed his authority. For example, while in the U.S. the CECA manager took it upon himself to begin negotiating with Westinghouse for equipment after the orders were already placed by the responsible contractor (ACEC), giving ACEC an excuse to blame subsequent delays on interference by the manager in the affairs of the contractor. The CECA manager also paid an ACEC employee one million Zaires in back wages using project funds without first checking with ORT. CECA has no contractual relationship with ACEC or the employee and the funds were being withheld as part of the payment to be made when construction was 60% complete. In addition, there were conflict of interest problems causing the CECA manager to be reprimanded at one point.

A major reason for greater difficulties in the planning and management of the CECA hydro facility was probably the remoteness of the location (eight hours flight in a single engine plane from Kinshasa) and the tendency of the CECA manager to think of the project as a CECA rather than an ORT/USAID initiative. However, these issues were handled and the project has continued to progress thanks to ORT's resolution of these issues through close supervision of the sub-project.

AS NOTED IN THE SECTION ON THE KODA SUB-PROJECT, THE MISSION RECOMMENDS THAT ORT CONTINUE TO SUPERVISE THE SUB-PROJECT CLOSELY UNTIL WORK IS COMPLETED IN LIGHT OF PAST DIFFICULTIES WITH THE CONTRACTOR AND THE CECA MANAGER.

3.2.2 Project Administration

Administration is clearly a strong point of this project. The Evaluation Team found the project's files to be as comprehensive, accessible and well organized as any the team has seen anywhere. Detailed and appropriate information was available on each of the sub-projects, technical and management data were kept separate, backup files were available and financial information was clear, complete and detailed. The project manager has received laudatory comments from USAID on the quality of his financial reports and the clarity of quarterly project performance reports.

The project office also appeared efficiently managed with the assistance of a competent office manager, an accountant and a Wang computer. The project manager was able to provide whatever information the Evaluation Team requested without delay. This attention to good organization and methods carried over into the stress laid by the project in management and administrative training for sub-project personnel.

One area where ORT should review its policies on a global basis is that of the personal use of project vehicles by expatriate staff. The Evaluation Mission believes that expatriate and HCN staff should reimburse USAID financed projects for the cost of project vehicle use outside normal working hours and for non-project activities. When expatriates have use of project vehicles for their personal use free of charge and the much more poorly paid HCN do not, friction and resentment are inevitable. ORT has experienced this problem before and has been previously advised to consider establishing a uniform ORT policy. The Mid-term Evaluation also stressed this issue and AID eventually (after a six month delay of its own) established a USAID Mission-wide policy regulating the private use of vehicles. To avoid this problem in the future, the Team:

RECOMMENDS THAT ORT CONSIDER ADOPTING A UNIFORM POLICY FOR ALL ITS OVERSEAS PROJECT STAFF THAT WOULD REQUIRE REIMBURSEMENT FOR THE PRIVATE USE OF PROJECT VEHICLES. THE MISSION ALSO RECOMMEND THAT ORT PREPARE TWO SETS OF BASIC PROJECT AND SUBPROJECT DOCUMENTS FOR TRANSFER TO USAID AT PACD. TECHNICAL STUDIES, BUDGETS, SEMI-ANNUAL REPORTS AND SOME KEY SUBSTANTIVE CORRESPONDENCE CONTAIN VALUABLE DATA FOR USE BY OTHER USAID PROJECTS AND ANY FUTURE PVO SUPPORT PROJECT. ORT SHOULD ALSO PREPARE A BRIEF ANNOTATED BIBLIOGRAPHY OF THESE DOCUMENTS AND CIRCULATE IT AMONG AID AND OTHER DONORS APPRISING THEM OF THE USEFUL DATA GENERATED BY THE PROJECT WHICH MAY BE OF USE ELSEWHERE.

3.2.3 Project Financial Management

Overall, the Evaluation Team has determined that the project's management of its dollar and counterpart fund accounts has been satisfactory. The Team reviewed the Price Waterhouse audit of counterpart funds for January 1985 to June, 1986, all counterpart budgets and the correspondence relating to the budgets and the audit. Dollar budgets and related correspondence were also reviewed.

The Scope of Work requested the Mission to review:

- 1) the management systems established by ORT and the sub-grantees for accounting, property control, financial procedures, etc.;
- 2) the recent counterpart fund audit;
- 3) the timeliness of the submission of required financial reports to USAID.

These items have been examined by the Team Leader of the Mission in order to determine the appropriateness and thoroughness of the financial management systems developed by ORT. The Team was also asked by USAID/Kinshasa to address the reasonableness of costs with particular reference to housing and office rents, and to the overall cost of project management.

3.2.3.1 Reasonableness of Costs

In a meeting with the USAID general services director, he stated that the average house currently being rented for USAID employees in Kinshasa averages somewhat over \$2,000 per month for new leases. Some less expensive apartments are currently rented by USAID for \$1,600 per month while some others are at \$2,500. The recently rented house for the USAID Deputy Director is \$3,170 per month. The 1987 rent for the ORT project manager's house is Z133,000 per month or \$1,209 per month.

Rents for other ORT staff have ranged from Z50,000 to Z75,000 between 1984-1986, including the project manager for most of that period. These rates during the period of the rentals do not seem excessive. In fact, the project manager's current rental is 40% below the average current rental cost quoted by USAID and 60% below that of the Deputy Director's house. The Mission concludes that the question of rental cost is not an issue.

The rental of office space ranged from \$1,500 per month in June, 1984 (at parallel market rates) to \$1,900 per month in 1987 for a staff of four expatriates plus three Zairians requiring office space, a meeting room and reception area. The size of the office accommodations do not seem unreasonable and, while they are well furnished, neither the audit nor USAID has objected to the amount of funds spent on furniture to our knowledge. The office is approximately the size of a residence and it is conveniently located near ECZ and USAID. Comparing the office rent to the house rents mentioned above leads us to conclude that office rents are not exorbitant.

It is true that there was a rent increase imposed by the landlord who thought (correctly as it turns out) that ORT would prefer to pay a higher rent to him than to bear the cost and disruption of moving for the seven months remaining in the project. The Team reviewed the background correspondence leading to the decision to pay the higher rents and notes that USAID was consulted at the time. Given the options, the Team concludes that the decision on rental space was prudent and reasonable.

The overall cost of project management is difficult to determine accurately since it depends upon partially subjective judgments as to what percentage of the time of each staff member was spent in providing technical assistance as opposed to the monitoring of project inputs and the associated administrative tasks. The Team asked the ORT project manager to estimate the division of time and also asked the available staff to make independent estimates. These estimates were compared and related to the actual work known to have been undertaken by reading trip reports and other documentation.

For the counterpart fund budget, if all project management costs are assumed to have gone to monitoring the project, the figures are 18% for 1985 and 15% for 1986. If a share of those funds equal to the estimated percentages of staff time spent on technical assistance (related to the dollar account) are deducted and the percentages recalculated, the share of counterpart funds spent on monitoring falls to approximately 15% for 1985 and 13% for 1986.

With regard to the dollar account (\$5 million), the project management cost increased by \$325,000 from the 1983 Cooperative Agreement figure of \$950,000 to the revised 1986 figure of \$1,275,000. For this increase, a total of 130 person months of expatriate staff time was delivered rather than the planned 60 person months. Two issues are involved at this point: the share of time (and thus cost) from the staff increase which can be allocated to technical assistance and whether the staff needed to be increased. For a discussion of the latter point, see section 2.1.1 above. Using the estimates of the share of personnel time devoted to the provision of technical assistance, the percentages of project management cost used for project monitoring fall to under 20%. Without this breakout of costs, the highest percentage found for project management was 25.5% (1986) but the Team believes this percentage is misleading given the substantial technical assistance delivered to the project.

Finally, it should be noted that adjustments to the project management budget and to the sub-project budgets over the life of the project do not seem

3.2.3.2 Timeliness of Financial Reporting

In discussions with USAID and ORT/Kinshasa, it has been confirmed that counterpart fund expenditure reports were provided to USAID on time. Financial reports for the dollar account were originally due to be submitted to USAID one month after the close of the reporting period. ORT requested an adjustment to permit the submission of data within two months of the close of the period and USAID agreed to the modification.

Despite this, at least 25% of the dollar account reports were received late by USAID. These reports were generated by ORT/London and ORT/New York and the delays seem to stem mainly from the complex and sometimes inefficient ORT practice of having ORT offices in three cities on two continents involved in backstopping and financial management of the project. Given the fact that the Cooperative Agreement was signed with the American ORT Federation and that project funds were from the U.S. government and kept in a U.S. account through a Federal Letter of Credit procedure, the Team:

RECOMMENDS THAT ORT REVIEW ITS FINANCIAL MANAGEMENT AND REPORTING SYSTEM AND CONSIDER CENTRALIZING THE BACKSTOPPING AND FINANCIAL MANAGEMENT FOR U.S.-FINANCED PROJECTS IN ITS WASHINGTON, D.C. OFFICE. ALL INFORMATION COULD BE COPIED TO LONDON TO MAINTAIN INTERNAL ORT CONTROLS BUT REPORTS COULD BE SENT DIRECTLY FROM WASHINGTON TO THE FIELD. IF NECESSARY, THE TELEPHONE OR TELEX COULD BE USED TO OBTAIN DATA FROM NEW YORK OR LONDON.

3.2.3.3 Financial Management Systems

During the Evaluation Team's meetings with USAID officials, ORT's financial reporting has been praised on at least three occasions. One USAID official remarked that ORT's reports were "the best of any USAID project in Zaire."

The recently completed audit of counterpart funds concludes on page 7, with respect to the evaluation of internal controls and the accounting system, that:

"...the organization, document and accounts design, and procedures employed by ORT are adequate to ensure that (1) subproject expenditure is allowable, authentic and accurately and completely recorded and (2) that funds and other assets are properly managed and safeguarded."

The audit also states (1) that comprehensive instructions are provided to sub-projects, including the preparation of budgets, utilization of accounting documents and journals, supplier selection procedures, imprest fund procedures and reporting requirements, (2) that accounting codes are appropriate to the needs of ORT and USAID, (3) that imprest funds provide a centralized control over cash operations, and (4) that the use of a system of "fiche de suivi des marches" provides a supplementary control over sub-project budget categories.

ORT also maintains effective property control systems with the master file updated every six months. Systems also exist for the regular maintenance of vehicles and maintenance contracts exist for major equipment items.

While there are a number of contentious issues raised in the auditor's report and there are a number of clarifications and rebuttals from ORT over specific expenditures or methods of calculating costs, these fall outside the Scope of Work of this evaluation and are a proper subject for USAID-ORT discussion with the auditing firm. The Team notes that no counterpart fund project management budget was prepared for the life of the project against which later expenditure patterns could be compared. Clearly such a budget should have been prepared. It is also noted that ORT's counterpart fund account often had excess funds due to a combination of underspending and overbudgeting. More effective cash management could have reduced the loss of funds due to inflation while the funds remained in a non-interest bearing current account. In so far as the systems and procedures set up to manage the financial aspects of the project are concerned, the Evaluation Team can only conclude that they are effective and comprehensive.

3.3 ORT Project Evaluation and Reporting

ORT was required to submit an evaluation plan to USAID prior to November 30, 1983. The plan was submitted to and approved by USAID. ORT was also required to submit semi-annual reports comparing actual accomplishments with established goals and objectives. These reports were read by the Evaluation Mission and were found to provide a thorough basis for understanding the progress of the project in prior years. Although not required, ORT/Kinshasa also began sending USAID monthly reports in order to facilitate USAID's "substantial involvement" in the project which was mandated under the Cooperative Agreement. ORT also conducted internal evaluations of the project periodically. Overall, the Team found ORT's reporting process and evaluation plan to be sound.

3.4 Procurement of Materials, Supplies and Equipment

3.4.1 Procurement Systems and Procedures

Two points should be noted at the outset of this discussion:

- o ORT had considerable difficulty in getting its procurement system to function properly, and
- o ORT managed to get the commodities to Zaire in spite of these difficulties and without major adverse consequences for the project.

ORT was responsible for procuring hundreds of tons of bridges, hydroelectric machinery, solar energy systems, pharmaceuticals, vehicles, medical equipment, culverts and other items. For the procurement of these items, ORT was paid a fee of \$150,000. It would be fair to ask the following questions:

- o How was the procurement organized?
- o How much was handled directly by ORT staff and how much was sub-contracted?
- o Did the above make any difference in terms of cost efficiency?
- o How much material arrived on time?
- o How much was damaged?
- o How much was improperly ordered or shipped?
- o How much was stolen?
- o What conclusions can be drawn or recommendations made as a result of ORT's experiences?

Procurement for U.S. commodities was handled from New York and was later switched to ORT's Washington office. Commodities procured in Europe were handled by ORT/London. The procurement fee, presumably, was for the cost of:

- o doing research on potential suppliers;
- o obtaining specifications;
- o obtaining competitive bids;
- o identifying efficient and cost effective transport;
- o arranging for insurance;
- o preparing documentation;
- o maintaining communication with Kinshasa regarding the status of orders, etc.

ORT/New York is reported to have sub-contracted most procurement to Worldwide Parts Inc. located in Tennessee and bids were sent through them. According to the ORT/Kinshasa project manager, orders were sometimes delayed, lost or incorrect. The project manager also complained of inadequate feedback on the status of shipments, making project and subproject planning more difficult. The Mission was unable to determine what proportion of commodities were obtained through the sub-contractor and what proportion was handled directly by ORT staff or whether this made any difference in the efficiency of the operation. This is an analysis ORT should undertake, if it has not done so already.

There are the usual stories of vehicles arriving without keys, scales and thermometers arriving not in the metric system and having to be returned and arguments over who would pay for the extra transport cost of returning them, lost (or stolen) spare parts, etc. Of greater importance is the fact that the project manager estimates that 80% of the commodities came as ordered the first time and, in terms of value, about 80% arrived on time. Less than one percent arrived damaged.

The longest delay in procurement occurred in the solar equipment for ECZORT. According to the ORT project manager, over twelve months elapsed between the placement of the order by ORT/Kinshasa and the receipt of a letter from ORT/Washington indicating that a competitive procurement was required. The panels have been received and the Mission saw several of them in operation at rural clinics (See Annex 3). The Mission has no explanation for the delay in procurement of these items.

In conclusion, available evidence indicates that ORT did a reasonably satisfactory job of procuring commodities with some exceptions. ORT's performance in this area is claimed to be superior to USAID's by several ECZORT people and even some USAID people have acknowledged that procurement and distribution of commodities in Zaïre remains a challenging proposition for everyone.

3.4.2 Procurement Waivers

The requirement that commodities purchased for USAID-financed projects must have their source in the United States unless a waiver is obtained has proved burdensome to the project and has resulted in delays in project implementation.

In francophone Africa, many U.S. suppliers are simply not present and are, therefore, unable to provide the maintenance and spare parts and other support needed for some equipment. In other instances, the required products are not packaged in a way that is familiar to local users (e.g. medicines often arrive with labels in English, in capsules of 500mg when the normal supply of the same drug is, for example, 250mg and in different colors from those supplied from France or elsewhere in Europe). When primary health care projects work with largely non-literate populations and the rural dispenser only reads French, the result is that the red pills are assumed to be the same as the red pills received last month, the dosages are assumed to be the same and the translations - if they are provided at all by local health care providers - can sometimes be incorrect in view of the technical vocabulary that often appears in pharmaceutical information accompanying various medicines. The result of these difficulties can range from everything from frustration at the loss of time involved in informing thousands of isolated rural clinics without telephones of new dosages and procedures to death from overdoses.

In the case of ACROW bridges purchased by the project, the only manufacturer is Thomas Storey of Britain. The project was obliged to order the bridges through the company's U.S. subsidiary which only distributes the bridges. ACROW USA special ordered 51% of the bridge elements in the U.S. to meet U.S. componentry rules. To avoid seeking a waiver for the remaining 49% of the bridge parts, they should have been shipped from Britain to the U.S. for repacking and shipping with the 51% U.S. portion in a single shipment. ORT/London claims it was not aware of this requirement and the British 49% of the bridges were shipped directly to Zaïre and ORT had to apply for a waiver retroactively.

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While the waiver for the shipment of the 49% of the bridges took only six weeks to obtain, the project manager estimates that ORT/London and ORT/Washington spent about nine months seeking a solution to what could have been a straight-forward purchase from the manufacturer. The additional cost to the project resulting from the special order in the U.S. of 51% of the components was \$450,000, enough funds to have built three bridges more than the nine completed by the project. On the other hand, the mission is well aware that an unstated objective of an ESF commodity project is to finance the export of U.S. goods even when they are considerably more expensive.

The Evaluation Team asked the project manager to compile a list of major waiver requests during the life of the project indicating the date of the request, the date of the decision by USAID on the request and indicating whether the request was granted. Of the 24 waivers examined, 23 were eventually approved. It took USAID an average of 6.5 months to respond to the ten largest waiver requests (with time ranging from 1.5 to 10.5 months). Of these, nine were approved and the one which was rejected (purchase of streptomycin) took eight months to reject. The remaining 14 waivers took from two to six weeks to be granted.

The amount of lost personnel time (USAID, ORT and the sub-project grantees who had to compile justifications and statistics for the waivers) has not been calculated and the delay in the achievement of project objectives cannot easily be extrapolated from these figures with any degree of accuracy. Nevertheless, one can conclude that the waiver system results in significant amounts of wasted personnel time, delays in project execution and rarely results (at least in this project) in purchases of U.S. commodities which would not have been bought in any case. In the one major instance where a U.S. supplier was strictly required, the extra cost to the project budget was \$450,000.

CONSEQUENTLY, THE EVALUATION TEAM STRONGLY RECOMMENDS THAT AID AND THOSE MANDATING SOURCE ORIGIN REQUIREMENTS FOR USAID PROJECTS CONDUCT A COST-BENEFIT ANALYSIS TO DETERMINE WHETHER CURRENT REGULATIONS ACHIEVE THEIR INTENDED RESULTS. AT LEAST FOR SUB-SAHARA AFRICA, IT WOULD SEEM THAT EASING THESE REGULATIONS OR, IDEALLY, WAIVING THEM ALTOGETHER WOULD BE ADVISABLE FROM THE PERSPECTIVE OF DEVELOPMENT ASSISTANCE NEEDS.

3.4.3 Local Receipt and Distribution of Commodities

Over 99% of all commodities received were safely delivered to their intended beneficiaries. For ECZORT, theft and breakage totaled 0.6% of goods, all but one set of spare parts was delivered to the DPP sub-project and all materials arrived for the Koda sub-project except for some damaged cables.

The major difficulty in the receipt of commodities has been the requirement that GOZ exonerations be obtained for all goods. This has proved to be an extremely time-consuming and frustrating business for ORT. Some local customs officials are used to less rigorous procedures and a sometimes ad hoc approach to processing arriving goods. ORT correctly held to the required procedures and this caused delay and extra trips to the customs clearance areas by ORT staff.

Previously, exonerations were handled by the U.S. Embassy since the Ministry of Foreign Affairs was involved in this process. Then USAID began to handle exonerations through its contacts with the Ministry of Finance. Then the U.S. Embassy pointed out that ORT is an institutional contractor and should, consequently, handle its own exonerations. While this saved USAID staff a good deal of time and frustration, it merely shifted the burden to the ORT staff. Recently, USAID established its own procurement and exonerations unit with a full-time section to handle the necessary paperwork and the development of inter-personal relations with customs officials. The Evaluation Team has learned that the Exonerations Unit will have as its purpose to support all USAID-financed projects to obtain exonerations. USAID is to be commended for resolving this important issue. Nonetheless, the Evaluation Team:

RECOMMENDS THAT USAID SHOULD INCLUDE IN FUTURE COOPERATIVE AGREEMENTS PRECISE INFORMATION REGARDING THE INSTITUTIONAL CONTRACTOR'S RESPONSIBILITIES IN THE AREAS OF EXONERATIONS, SHIPPING, PERMISSIBLE STYLES OF HOUSING, AND U.S. MISSION SERVICES IN GENERAL.

IV. Project Backstopping by USAID

The Cooperative Agreement stipulates that USAID was to have "substantial involvement" in the management and approval of project and sub-project activities. More specifically, USAID was obliged to concur in:

- o the establishment of procedures for the management and disbursement of funds;
- o the establishment of categories of commodities to be purchased in the U.S. and locally;
- o the establishment of reporting procedures and schedules;
- o the establishment of financial management systems to monitor sub-grant expenditures;
- o the establishment of criteria for the selection of sub-grantee PVOs;
- o the selection of each sub-grantee;
- o the selection of the sites for sub-grantee activities;
- o all sub-grants, by giving prior written approval;
- o any redirection of sub-grantee activity while also reserving the right to initiate such redirection.

From the USAID perspective, the ORT management team was new and untested whereas USAID is a permanent presence in Zaire with greater knowledge of conditions in the country and of the development priorities and strategies of both the GOZ and USAID. Further, the PVO Economic Support project suffered from the lack of a Project Paper, the absence of pre-feasibility studies and only minimal baseline data. Proper background documentation for the project could have given in depth guidance on project objectives and likely constraints. In effect, USAID saw ORT as a convenient institutional vehicle for implementing certain activities which USAID had already decided upon and which could be carried out through the rapidly disbursing ESF mechanism.

Initially, USAID viewed the project as a commodity procurement and distribution effort linked to other goals. For example, the ECZORT sub-project was primarily a means to provide needed commodities to support the USAID-financed SANRU health project without routing the funds through an entity associated with the GOZ in order to meet Congressional objections on this score. The Noda Falls project responded to USAID's interest in testing the development of a mini hydro scheme as a pilot project which might be replicable elsewhere while, at the same time, responding to a previously submitted request from American missionaries for assistance in electrifying their mission station using hydro rather than the more expensive diesel fuel system which had been in place for several years. The roads and bridges project in central Bandundu region had also been identified by USAID prior to the signing of the Cooperative Agreement.

To a considerable extent, therefore, the impression left in the Cooperative Agreement that ORT was to establish criteria and select projects and PVOs to implement them was fiction. This fact, combined with ORT's interest in expanding the institutional development component of the project led, in the first two years, to some frictions between USAID and the ORT management. ORT submitted the required materials for the concurrence of USAID to meet the substantial involvement clauses enumerated above. The systems, criteria and sub-grants were all eventually approved and the quality of these items is discussed elsewhere in this report.

The tension in the USAID-ORT relationship, therefore, seems to have emanated from the differing concept of the project held by USAID officials and ORT personnel. USAID wanted rapid disbursement of funds to purchase U.S. commodities while ORT placed greater emphasis on the long term development impact of the planned procurements and the institutions who were to receive them. For over a century, ORT has fundamentally been a training institution and it sought opportunities to use its training expertise to link the provision of commodities with interventions to strengthen the recipients.

The nature and extent of USAID's substantial involvement (backstopping) of the project was known to ORT before the start up of the project and ORT had agreed to this. The fact that the ORT project manager found this to be excessive does not imply it was inappropriate or unanticipated. Again, a thorough orientation of the project manager by ORT before his arrival in Kinshasa might have lessened some of these difficulties. After the mid-term

evaluation, the intensity of USAID's involvement lessened since all the sub-grant agreements had by then been signed and USAID was satisfied that what was being undertaken conformed with USAID's wishes. More of the actual implementation was left to ORT and the sub-grantees and the issue of the level of USAID's involvement became insignificant.

With regard to the quality and timeliness of USAID backstopping support to the project, the major dissatisfaction expressed by the ORT project manager was the termination of USAID's assistance in obtaining exonerations and the length of time taken to decide on procurement waiver requests. These issues are treated elsewhere.

The Team's impression of the knowledge and commitment of the USAID project officers responsible for backstopping this project was quite favorable. Both Ms. Newman and Ms. Felkel had a detailed knowledge of the project's many elements, had visited the project sites on several occasions and were aware of the successes and limitations of the project. They provided valuable insights to the Evaluation Team and were able to assess both ORT's deficiencies and strengths and those of their own organization.

V. ECZORT SUB-PROJECT

5.1. Introduction to ECZORT

ECZORT, (an acronym that combines the Eglise du Christ au Zaire (ECZ), the sub-project grantee, and ORT), is the executing agency for the health sector component of the project. The sub-project goal was to improve the health status of the rural population by increasing the proportion of rural Zairians that have access to basic health services by the establishment of a system of self-sustaining community supported primary health care in 38 rural health zones.

To achieve the goal, project 097 was to assist PVOs working in the health sector to attain the following objectives :

1. to upgrade 200 curative dispensaries into full service health centers providing promotive, preventive and basic curative services;
2. to spread and institutionalize a self-sustaining, affordable basic rural health services delivery system.
3. to increase the effectiveness of selected PVOs working in the health sector by expanding and strengthening their long term institutional capability to implement relevant development projects in rural Zaire.

The sub-project will be evaluated following its performance in providing required inputs and more important, in producing expected outputs and in achieving the assigned objectives and goal.

5.2. Inputs

5.2.1. ORT Inputs

Personnel : An expatriate health coordinator served as the link between the project (ORT) and the sub-project (ECZORT). Her major duties included monitoring sub-grantee expenditures, determining technical assistance needs of staff training, equipment maintenance, management procedures and commodity selection; and monitoring and evaluation of sub-project activities to assess performance and progress. Overall, the health coordinator's job performance has been very satisfactory in that all of the above duties were carried out in an efficient and timely manner. While the evaluation team appreciates her performance, it has found no evidence to support the need for an expatriate to perform this particular job. The coordinator stated that a qualified Zairian could have been hired to perform the job, thereby saving a substantial amount of project funds. The team believes that insufficient effort was made to take advantage of local expertise in this instance.

ORT also supplied a technical coordinator who worked within ECZORT to assure project implementation. The coordinator performed well and made a solid contribution to achieving project objectives.

Finances and Procurement: A budget of \$1,752,400 in foreign currency and Z. 48,224,000 in CPF was approved. For a breakdown of expenditures see Annex 4. As stated in the project agreement, ORT retained the responsibility for dollar disbursement and this became an issue of concern at the project and the ECZ level; it is dealt with in more detail under project general management. Counterpart funds were made available and were disbursed according to an approved budget. More detailed discussion on the management of these funds is provided below under ECZ inputs.

Procurement from overseas has proved efficient and reliable. As compared to the SANRU I Project which had its procurement through AID/Washington, Project 097 was by far more efficient: orders that were placed through ORT/New York were received in Kinshasa within six months approximately, while through AID, SANRU experienced delays ranging from 12 to 24 months.

5.2.2. ECZ Inputs

ECZ's expected inputs were in the categories of personnel, office space, salaries for some of the health personnel and, of course, management.

In general, ECZ provided all required inputs to execute the project. Both the director and deputy director of the SANRU I project, namely Citoyen Nlaba and Dr. Baer, were also appointed to assume these roles within the ECZORT sub-project. At the beginning, Cit. Lokangu of the ECZ's medical bureau was appointed as the sub-project manager on a part-time basis, but

following an internal reorganisation of the bureau, Mr. Brewster (who had been serving as the technical coordinator), was appointed as the sub-project manager. Other support staff such as store keeper, drivers, etc. were from the SANRU project.

ECZ also provided office and warehouse space in Kinshasa. Other contributions of the ECZ and the participating PVO's included local labor for rehabilitation work and staff salaries for those working in the new health centers. In all cases, local labor was indeed provided, but salaries for the health staff members were not necessarily paid by the participating PVOs. In accordance with the self-financing policy being promoted, health center staff were paid through the center's own resources.

ECZ management of the sub-project was generally very satisfactory. Commodities were stored and shipped to the health zones in a timely manner and all MCZ who were visited during the evaluation trip expressed admiration for ECZORT's performance in shipping commodities even to the most remote areas of the country on time and with very minor cases of loss or damage.

Financial management of the sub-project was generally adequate. A monthly report was submitted to the project, giving details on all expenses incurred. The team realizes that being primarily a commodity supplying sub-project, ECZORT had to incur high expenses, especially when transportation is difficult in remote rural areas.

5.3. Outputs

According to the project paper, the sub-project was supposed to produce three broad categories of outputs : rehabilitation, equipment and drugs, and training. Each category is examined separately below.

5.3.1. Rehabilitation

Each of the 38 health zones that were assisted were asked to estimate their needs in rehabilitating health centers and central bureau offices. In accordance with their own planning, the Chief Medical Doctors (Médecins-Chefs de Zones or MCZ) proposed the buildings in need of rehabilitation work.

The project paper estimated rehabilitation needs based on 160 health centers, 40 reference health centers and 38 reference hospitals. Initially, the estimated costs for each of the above health facilities were as follows:

- Z. 50.000 for the health centers
- Z. 150.000 for the reference health centers
- Z. 250.000 for the reference hospital

It soon became apparent that those figures were too low as compared to actual costs of rehabilitation in the field. Given financial constraints, the overall rehabilitation budget of Z. 23.500.000 remained unchanged, but revisions were made within that budget to make more funds available for the buildings that were in greater need of rehabilitation, i.e. the health centers. The revised budget allocated an average of Z. 85.000, Z. 125.000 and Z. 200.000 to each respective category.

In the field, rehabilitation work varied widely from one center to another. It meant remaking a roof, replacing windows, repairing a damaged floor, painting walls, etc. The sub-project supplied funds to purchase the required materials locally. The use of those funds was left to the MCZ.

The evaluation team was not aware of a single case where the use of those funds was decided upon jointly by the beneficiary population and the MCZ. Even Zone administrators complained about not being involved in deciding how funds were used. It is not certain that funds were always properly used at the health zone level, i.e. a gallon of paint or any other item may have been purchased at any price and so long as a receipt could be produced reimbursement was made. In Zaire receipts do not always reflect the actual prices of goods or services purchased; the question of proper use of ECZORT funds for rehabilitation remains an issue. ECZORT did not establish a reliable monitoring system of funds that were disbursed for rehabilitation, the zones were required to send only a report. To date reports have not been received from all the participating zones.

One of the MCZ's visited by the evaluation team conceded that ECZORT did not ensure much control of the use of the funds that were sent. He even pointed out that we (the team) were the first to ask how those funds were actually used. He urged that a systematic control system be established. The team understands that this requires much supervision. It also realizes that supervision is expensive and time consuming and that limited personnel (the project health coordinator and the sub-project manager) had little time for supervision; however, it recommends that this function be seriously considered by SANRU II.

The lack of control of the use of funds was aggravated by the fact that funds were not always used as soon as they were received. With the fast growing rate of inflation in Zaire, the result is that most zones have been incapable of purchasing all of the required materials.

Despite those shortcomings, rehabilitation work has taken place in all participating zones. By the time of this final evaluation, it is estimated that 30 to 40 % of the planned rehabilitation work is actually complete, yet, funds have been distributed for nearly all centers and reference hospitals that had been proposed.

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The quality of the rehabilitation work is discussed in more detail in the part C of the engineering report, however, in most cases, it was not of high standard, especially in the health centers. Many rehabilitated health centers may require further work in the near future. The team considers that the quality of the work performed reflects two facts. First, the amount of funds allocated per health center was insufficient. Little rehabilitation can be accomplished with Z. 85,000 (\$ 800), which is still well below the Z. 150.000 figure estimated and recommended by a National Forum organized in December 1984 by the Department of Plan to address this issue. In addition, when those funds are not necessarily well used, the quality of work performed may be seriously affected. Second, the rehabilitation program was based on community participation and labor had to be provided locally. Masons and carpenters who were used to perform the work were not therefore always highly qualified.

At the Vanga health zone where the central pharmacy was one of the rehabilitated buildings, more qualified masons and carpenters were used, and the quality of the building is impressive.

Notwithstanding the quality of the rehabilitation work, the impact on the population cannot be overlooked. This is discussed in a subsequent section dealing with the overall impact of the ECZORT effort.

5.3.2. Equipment and Drugs

Referring to SANRU's list, ECZORT provided health zones with a standard equipment kit including microscopes, stethoscopes, needles, bassins, scales etc. and basic drugs such as nivaquine, oral rehydratation salt, and penicillin.

An end-use tracking system was established and proved to work reasonably well. Records of commodities shipped from the ECZORT central office to the Central Bureau of the health zone (BCZ) and from the latter to the health centers were well kept at each location. This made it possible to track all the goods that were procured and shipped to the health center as well as those kept at the BCZ. Any discordance between the quantity or quality of goods shipped and those actually received had to be reported. ECZORT has performed extremely well in this, as few such cases were found.

While the ECZORT equipment sent to the health zones and centers has generally been well appreciated, the most troublesome commodity remains the Ross bicycle. As one MCZ put it, "ECZORT made the same mistake as SANRU : they have sent ROSS bicycles

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with impressive numbers of spare parts that are less needed (tires, spokes, saddles, and rims) while hubs which have proved extremely fragile were not provided and cannot be found locally. There was also mention of the scales that ECZORT provided. Some MCZ complained that the DECTETO model 01171 is not reliable ; moreover, the scales were sent with no knickers to weigh children.

While all the MCZ have acknowledged the importance and usefulness of the ECZORT equipment package, they have also expressed concern about the fact that it is too standardized. To cite only one of the simplest cases reported by one MCZ, all the gloves received were of size 7 1/2 ; yet among the users, there are people who need larger gloves. Another MCZ noted that the health centers of his zones are more in need of hemoglobinometers whereas he received a pelvimeter which is nice to have, but is not a priority.

The evaluation team realizes that ECZORT could not respond to all the needs of the health centers to be assisted. At the same time, it believes that actual needs should have been assessed among the zones to be assisted. In effect, what is a priority need in one zone may not be so in another. Moreover, the team holds the view that the inputs of the MCZ to be assisted should have been sought.

As with rehabilitation funds, the distribution of drugs to the health centers was left mostly to the MCZ's discretion. In many instances, those drugs were not sent only to health centers that had been proposed for ECZORT assistance but to all the health centers of the zone.

The evaluation team heard no major complaints from the MCZ or head nurses regarding drugs supplied by ECZORT. However, they expressed need for basic laboratory products to be used with the microscopes that have been provided.

In general, all the equipment that had been foreseen was procured and sent to the zones to be assisted. They are in full use and well appreciated by the medical personnel, the members of development committees and the patients themselves.

5.3.3. Solar Installations

The sub-project was supposed to install solar panels in 40 reference health centers/general reference hospitals. Of those, 39 have actually been installed along with solar powered refrigerators. The quality of the installations is discussed in the section dealing with electrical engineering. However, it is important to mention here that these installations have been

most valuable in rural areas. Other than the possibility of keeping vaccines at a reference health center, hence making it possible to undertake an outreach vaccination program, solar power has made it possible to have maternity services at night. In one general reference hospital, emergency surgery has been possible even at night. To show his appreciation of the services that solar power has rendered to his patients at that reference hospital, the MCZ considered it to be a "miracle".

Three solar pumps were also planned. By the end of the first quarter of 1987, two pumps had been installed in two general reference hospitals.

5.3.4. Training

Detailed discussion on the ECZORT training program is provided in Annex 2. Quantitative objectives of the program were, in most cases, surpassed while the quality was often below standard. It clearly appeared to the evaluation team that except for the management training intended for MCZs and health administrators, the sub-project stressed quantity more than quality. The team recommends that follow up evaluations of courses and course materials be undertaken so as to constitute a set of reliable and high standard materials that can be reproduced and widely used throughout the country.

5.3.5. Overall Impact

The sub-project has assisted 156 health centers and 44 reference health centers to receive rehabilitation funds and basic equipment. There is evidence that those health centers are now providing not only curative, but also preventive and promotional health services. Among these, mention can be made of prenatal and under five clinics, vaccination, and family planning.

Of crucial importance is the question of the impact that the upgrading of dispensaries has made on the population. The question is certainly premature less than a year after the sub-project has ended, especially if one is interested in the impact on the long run. At present, the team can only offer its impressions based on observations made in the field.

First the evaluation team observed pride and joy among the beneficiary community members whose health center's rehabilitation had terminated. Members of development committees that were met during the field visits spontaneously expressed satisfaction for what had been accomplished in their communities and eagerly sought more of similar actions. Second, and more important, several cases were found where the numbers of patients using the rehabilitated facilities had tremendously increased. To cite only a few, in one health center, a long time

abandoned building (since independence) had become a hen-house; it has been rehabilitated and is now used as the reference health center's maternity. Since then, the number of pregnant women using the center for delivery has steadily increased from an average of ~~5 to~~ 10 to over 30 a month. The head nurse expects this number to increase again. Another case was reported by a MCZ that prior to the rehabilitation of the health center there were an average of 4 new patients seen every month. Now that figure has increased to about 25 to 30 a month. In another reference health center, records showed that prior to rehabilitation an average of 50 new patients were registered monthly. On April 23, when the team visited the center, the nurse had already registered 120 new patients. He also expected about 150 new patients by April 30.

Of course, it is hard to ascertain that those results are solely due to the rehabilitation work that had been performed in the health centers and to the basic medicines and equipment received. Also it is not possible to generalize that rehabilitation work and basic drugs and equipment will always have the same impact everywhere. However, the team strongly agrees with the MCZ's that were met during field trips, that a well rehabilitated health center - where basic laboratory tests can be made, and basic medicines can be provided - encourages patients to use the facility and has a positive psychological effect on them.

5.4. Sustainability

5.4.1. Toward self-financing health care in Zaïre

As noted by the World Bank, the Ministry of Health has been unable to develop a cadre of qualified and motivated medical teams who could provide supervision and evaluation of health zone personnel. A major constraint for the Ministry has been inadequate financing which has led inexorably to extremely low salaries and acute shortages of medicine, supplies and equipment.

To help offset the financial constraints in the health sector, USAID has placed emphasis on "end-user fee systems" while emphasizing low cost primary health care for which responsibility is decentralized to the RHZ level and below. A major effort has been made by the ECZORT project to establish and maintain an end-user fee system through the provision of "seed stocks" of medicines which, through sale to health service consumers, are expected to generate sufficient financial resources to resupply the health centers and cover the cost of as many other health center needs as possible (i.e. in addition to re-supply of medicines can be added local salaries, general supplies, spare parts for the bicycle or motorcycle used by the health center, etc.).

The experience of the ECZORT project in establishing and institutionalizing a user fee system has been mixed. For example, in Equateur Province an ECZORT monitoring visit trip report noted that in PIMU there is an autonomous and active health committee which hires and pays its own health personnel from user fees. The community is reported to view these fees as "normal and expected". The center has been self-financing since 1978. Similarly, the health zone at Tandala (Equateur) has, according to another ECZORT report, "an impressive record of auto-finance success". On the other hand, some zones (e.g. Dingu as of September 1986) had not yet set up a Zonal Management Committee which is a prerequisite for the institutionalization of a user-fee system. Other centers (e.g. Kananga - Bibanza as of November, 1986) suffered from unacceptable stock management systems, making it difficult to track supplies and restocking efforts. Elsewhere, medicines supplied by the project were found to have been co-mingled with general zonal supplies rather than used to launch new or rehabilitated local health centers with an initial stock.

One center in the Rathy health zone has been able not only to cover all of its recurrent costs, but also to save enough money to invest in capital goods such as the purchasing of extra bicycles. Other centers can barely save Z. 1000 a month after recurrent expenses have been paid for.

There are numerous variables which affect the potential for long-term self-financing of the rural health centers and these variables were much in evidence at the centers visited by the evaluation team and in the many ECZORT trip reports. Among these are :

- ° Length of time the health center has been in operation;
- ° Presence and duration of missionary or other expatriate assistance;
- ° Economic condition of the health area, zone or region;
- ° Quality and commitment of local health care providers;
- ° Presence and level of activity of the local Comité de Santé and /or Comité de développement;
- ° Frequency of monitoring and support visits from the zonal staff (which varied in part according to remoteness of the center and the condition of roads and availability of transport);
- ° Number of personnel whose salaries are paid by the GOZ.

Given these variables, there is clearly no single formula for achieving the project's objectives in so far as self-financing is concerned. There are also a number of issues of central importance to the concept of user supported health care which must be addressed which go beyond determining prices for medicines and services and ensuring proper record keeping and accounting. Of particular importance is the question of at what point user fees begin to be self defeating of the initial goal of providing rural health care to very poor rural populations. Obviously, some medicines will need to be provided free of charge to some people and some centers will be able to pay a greater proportion of their total

costs than others given the variables listed above. The level of self-financing in a given center or zone is also likely to vary over time as economic conditions change and other factors arise. The limited self-financing ability which has been achieved at some centers is currently placed in the greatest jeopardy by the high inflation rate in Zaïre which drives up the costs of medicine, transport, etc. (currently estimated at 50% per annum).

According to the FY 1988 ABS, USAID is planning a study with the centrally-funded REACH project to do an in-depth inventory and analysis of a wide range of cost recovery systems under various socio-economic conditions in Zaïre. The results of this study will have important consequences for ECZ's continuing efforts to ensure sustainability of the project's achievements and will no doubt affect the planning and activities in the Basic Rural Health II (SANRU) project which is being implemented through ECZ.

It is beyond the ability of the Evaluation Team to undertake a detailed assessment of the user-fee system within the ECZORT project given the number of issues to be covered by the evaluation and the time available. However, the following observations do bear on this issue and represent the consensus of opinion of the evaluation team which divided into sub teams, inter alia, in order to visit rural health centers in bas-Zaire, Bandundu and Haut-Zaire. These points are elaborated elsewhere in this report but they are ones which the USAID/REACH study should also address in their forthcoming comprehensive analysis, some of which will simplify their task.

- ° The team found record management in nearly all centers to be diligent and detailed. The project introduced "fiches de contrôle" for the supply and re-supply of medicine and supplies; records were maintained of patient visits, of diagnoses, of findings from the use of the microscope, of rehabilitation materials received, etc.
- ° In several centers, the team also saw records of fees collected and the dates on which payment was made and what medicines or services were purchased.

In its study of user-fee systems, the REACH study should obviously refer to prior studies on the financing of health care systems. Of particular interest to Zaïre may be Richard Weber's recent analysis of sustainability of health

Finally, the Evaluation Team believes that, while examining the variety of cost-recovery systems operating to one degree or another in Zaïre, the REACH study should also investigate and produce a separate report or annex dealing with the microeconomic context in which the health care system and its individual rural centers must operate. This would include real opportunity costs to consumers of resources used in acquiring health care, the threshold of resistance to paying for health care by persons with varying household incomes, the possibility and cultural factors which may promote or constrain community level health insurance schemes, possibly managed by a Comité de Santé or a zonal committee, the existing expenditure patterns of household incomes in sample villages, the variation in availability of financial resources at different times of the year, etc.

5.4.2. Community Participation

As noted above, the sub-project sought to establish a community supported health system in the rural areas. Although the project paper neither specifies what participation is, nor indicates how it can and should be measured, the team believes that, in so far as health activities are concerned, it can be assessed through a few indicators such as :

- (i) the degree of involvement in a project of common interest to the community, e.g. contributing labor or materials (sand, gravel, wood, etc.) for the construction of a building at the health center.
- (ii) the degree of acceptance of health related messages and that of urging others to do the same, for example, the message may be to attend under-five clinics, a family attends and encourages others to do the same.
- (iii) the degree of interest in all matters related to the health center, for example organize and attend meetings to examine any problem of the center, set up self-help mini-projects, etc.

It clearly appears that such indicators can hardly be assessed in quantitative terms, except saying for example, X number of meetings were organized and Y number of people attended. While such measurements may give useful indications concerning community participation, they say little about its quality. Participation is more a question of motivation. For example, there is true participation in the construction of the health center not because people are forced to, but because they have come to appreciate the necessity for them to do so.

Of capital importance from the evaluation standpoint is the question of whether the sub-project has been successful in promoting community participation. Unfortunately, it is a difficult question to address, because there are no established criteria to measure success in this area. All that can be said from field observation and reports is that there exists some evidence of community participation as far as contribution to rehabilitation work is concerned, and that this

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participation varies. With the short visits made by the team, it could only assess this degree of variation through the dynamism and enthusiasm expressed by the "Comités de développement". Just what determines such variation, is another crucial question that the team is unfortunately unable to answer. As discussed in the section on training, this is a point where the present evaluation joins one of the conclusions reached by the SANRU I final evaluation: qualitative research is needed to gain clearer understanding of factors that affect community participation in rural Zaïre.

The most visible and crucial factor that is very likely to undermine the efforts of development committee members - who serve as catalysts in ensuring that the other members of the community participate - is voluntary work. They have consistently asked for a salary or some other sort of incentive, e.g. free medical care. They have been told several times that their work is voluntary, but this is not well accepted. As a result, many members become less and less active, which in turn affects the degree of participation of the rest of the community members. Benevolent work is certainly a limiting factor, but it is still necessary to find out why participation varies among or within communities while it is free in all communities.

5.4.3. Institutional Strengthening of PVOs

The sub-project was also expected to increase the effectiveness of selected PVOs working in the health sector by expanding and strengthening their long term institutional capability to implement relevant development projects in rural Zaïre.

A number of actions were undertaken by the sub-project in an effort to meet this objective:

- i At the national level, the sub-project established a system and procedures of control of counterpart funds and commodities. The system has been established and the medical bureau of ECZ can now use it through the SANRU II project that it manages. Although the system has been established, it does not follow that ECZORT itself used it efficiently. As previously discussed, funds that were disbursed for rehabilitation were not sufficiently controlled.
- ii At the regional level, the sub-project held two training seminars for the ECZ's managers of the "Groupes Techniques Régionaux" (GTR). As discussed in the training section of this report, these seminars sought to impart basic skills in planning and evaluating a regional development project. The evaluation team was unable to meet with those regional managers of the GTR, moreover, no follow up has taken place to enquire about their performance in using those skills.

- iii At the local level, the sub-project contribution has been the training of MCZs and rural health zone administrators in the management of human, financial, drug, and material resources, and in planning and evaluation.

As was the case with other objectives of this sub-project, no clear indicators had been defined during its conception phase, thereby making it difficult for the evaluation team to assess the degree of success of the sub-project in achieving the objectives.

In the Evaluation Team's view the third action, that of training MCZs and administrators in management, planning and evaluation, is the most important action, followed by the training of GTR managers. The management modules are technically of high quality and have reached a large target population, that of MCZs and administrators. This training will be continued by SANRU II and will reach all MCZs and administrators in Zaïre.

The course on regional planning and project evaluation will have to be evaluated before much can be said about it. With regard to the control system that ECZORT has established and is now in use by SANRU, the team believes that it may track the location of equipment sent to the zones, but it is much less efficient concerning the use of funds in the field.

While the Team appreciates the contribution of these three actions to the effectiveness of PVOs, it believes that more could have been done at the local level, for example, training PVOs in integrating health related activities into other economic activities at the community level. The LOKO experience in Equateur Province where economic and health activities are planned and executed as a joint and integrated effort by the health zone could have been examined and taught to other health zones. Of course, that is only an example to illustrate that the sub-project could have thought about more actions to actually help the PVOs undertake and implement development projects in rural areas.

5.5. Lessons Learned

As a commodity procurement sub-project, ECZORT has undoubtedly successfully achieved its objectives in an amazingly short period of time. Given the size of Zaïre and its poor transportation network, ECZORT must be highly commended for procuring commodities and funds and shipping them to 40 health zones, many of which are scattered in remote areas of the country. From the viewpoint of the participating health zones, ECZORT intervention was so fast, so easy to obtain, with virtually no strings attached to it that several MCZs called it true aid. Good programming, good knowledge of the

transportation companies and mostly the fact that ECZORT worked hand in hand with SANRU I and hence benefitted from its experience are some of the factors that account for the success.

Most quantitative objectives of the sub-project were achieved and even surpassed, while quality control was overlooked in several instances. For example, funds were sent to rural health zones for rehabilitation but there was no reliable mechanism to ensure that the funds were well used in the field and that the work that was undertaken with those funds was of acceptable quality.

Other than distributing commodities and funds for rehabilitation, ECZORT devoted substantial effort to ensure institution building with the participating PVCs. Management and technical training was provided especially to individual health zones. ECZ, as the sub-project grantee, benefitted from ECZORT's institution building effort through its regional technical groups (GTR).

Again, as far as quantity (target number of people trained) is concerned, objectives were achieved but the quality of the training provided was questionable. The materials produced for the management modules, which in the evaluation team's opinion are of high quality, were based on a needs assessment, were tried out on a target group and then revised after a follow-up evaluation.

It is certainly too soon to assess the impact of ECZORT intervention. The team can only report on two major observations it made from its field trips in the participating health zones.

- (i) There is pride and a sense of achievement among the community members whose health center has been rehabilitated and can provide basic medicines and laboratory tests. There is no doubt that ECZORT intervention has been considered salutary especially where a dispensary had been in ruin and abandoned. There the need was greater and ECZORT intervention was most valued.
- (ii) There is evidence that several health centers which have received ECZORT intervention are now used by more patients than before.

The ultimate goal of the sub-project was to develop a self-sustainable health system in rural areas. The team considers that ECZORT has undertaken an important step in laying the groundwork for such a system. In effect, such a system must be based on two important and interrelated concepts: self-financing and community participation. Through ECZORT intervention, it has been possible to ensure some degree of self-financing and of community participation, however, two main factors may hamper this effort: (1) there is the difficult economic condition of the country with its fast growing rate of inflation which makes the cost of health care more and more unbearable to the rural poor, and community participation does not seem to be highly appealing. Little is known about the factors that determine the degree of community participation in Zaïre. However, it appears that its voluntary nature may be self-defeating altogether. The need for gaining clearer understanding of community participation in Zaïre is urgent.

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5.6. Recommendations

1. ECZORT experience in distributing commodities was so successful and useful in the field that a similar approach should be considered by SANRU II. Although SANRU II, which is supposed to take over ECZORT activities in 100 zones, may soon become overwhelmed by its own activities and those of ECZORT, the latter's experience in commodity distribution should not be lost.
2. ORT has been comparatively more efficient in procuring commodities for SANRU than USAID, ORT might be considered for the procurement of commodities in the future for SANRU II if this is feasible.
3. Whether ECZORT activities are carried out by another similar project or by SANRU II, care should be taken that not only quantitative objectives be sought but more emphasis be laid on quality control. In line with this :
 - i. Prior to assisting health zones, their needs should be assessed so as to respond as much as possible to their individual priority needs.
 - ii. More supervision should be scheduled to make sure that funds are properly used.
 - iii. The rehabilitation package should make provision for a contract with a local work foreman for each zone to be assisted. In order to avoid overburdening the health zones which are already struggling to pay existing personnel, the salary of the work foreman should not come from the zone, but should be included as part of the whole package of assistance to the zone. The work foreman would not become a permanent member of the health zone staff since his contract would last only as long as the rehabilitation work is ongoing. While community participation is providing much of the local labor and construction materials (sand, water, stones, etc) and should remain the backbone of the entire rehabilitation program, the role of the construction technician would be that of a foreman who ensures that the construction work done by local masons and carpenters conforms to acceptable norms and that a rehabilitated building will last a few years before needing more rehabilitation work.

The mission recommends that SANRU consider employing a construction technician to be based in Kinshasa whose job would be to act as a "circuit rider" to teach in a 2-3 day seminar practical masonry, carpentry and other basic rehabilitation skills in the villages. Two or three villagers could be chosen for this training and would receive a certificate identifying them as volunteer consultants for rehabilitation and maintenance of the rural clinic.
4. Institution building must be stressed as an important component of SANRU II. Among some of the actions that should be taken, the following must be considered as a priority :



- ensuring training of high quality to the health personnel;
 - developing and promoting training materials;
 - when long term expatriate technical assistance is used, a Zairian should be associated so as to ensure that transfer of technical "know how" takes place.
5. Should further assistance be provided, it should concentrate on health centers where the need for help is greatest and focus more on mini integrated self-help projects. In this regard, experiences such as that of the Loko health center in Equateur and that of the D.P.P. in Bandundu should be examined to integrate health and small economic activities.

VI. THE DPP SUB-PROJECT

6.1 Introduction to DPP and the Sub-project

Développement, Progrès Populaire (DPP) was established in late 1964 as the development service of the Diocese of Idiofa in the Bandundu and Kasai Occidental Regions of Zaire. The diocese covers some 38,500 Km square and has a population estimated at 825,000 inhabitants. DPP is registered as a non-profit organization and is governed by the diocesan development committee. Project activities are supervised by a management committee composed of the Executive Coordinator (Abbé Phulushi) and the heads of DPP's four service divisions, one of which is responsible for executing the USAID/ORT sub-project (the Infrastructure Division).

DPP reported a total of 291 employees as of December 31, 1986, including 58 in management and general services, 19 in agriculture, 45 in education, 92 in livestock, 10 in infrastructure and 67 in three sub-regions. DPP also reported having 67 full-time community development agents (animateurs), of whom 45 are women. Twenty DPP staff worked on the USAID/ORT sub-project during 1986. DPP reported having 16 trucks and jeeps in its fleet (including three provided by USAID/ORT), 15 motorcycles and 86 bicycles as of the end of 1986. This provides the reader with an idea of the scope of DPP's human resources and its mobility.

DPP implements projects in the diocese through a pyramid structure which includes five sub-regions, 27 parishes and an average of 60 villages per parish. DPP activities are open to all residents without regard to religious preference and DPP employes both Catholics and non-Catholics. Substantial assistance is provided by MISEREOR, a Catholic non-government organization (ONG) based in the Federal Republic of Germany.

The ORT-DPP sub-project agreement covered the period November 1, 1984 to December 31, 1986 and provided DPP with \$1,145,000 and Z29,788,000 to implement the project's objectives. Counterpart funds were made available by the ORT through USAID from resources generated by the sale of U.S. PL480 commodities in Zaire. The sub-project's objectives were:

- o Rehabilitation of 750 kms of feeder roads by replacing aging ferries with bridges in as many as nine locations, the installation of culverts and the improvement of side drainage at selected sites.
- o Provision of management training and assistance to DPP to strengthen its capability to implement the sub-project agreement and future projects.

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6.2 DPP Inputs to the Sub-Project

DPP contributed sub-project management and supervisory services, including personnel management, accounting and local procurement services. Under the terms of the sub-project agreement, DPP was prohibited from invoicing the overhead costs of their staff time and all construction, installation and repair work was billed at cost. Specifically, DPP was required to submit quarterly and yearly counterpart fund budgets, to maintain a daily accounts journal with expenditures entered by budget category, to prepare a monthly financial report, to prepare quarterly implementation reports, to prepare regular and detailed work plans, to spend considerable time travelling to bridge sites to conduct on-site inspections, to meet with ORT and USAID personnel, to carry on routine correspondence and perform other management, administrative and evaluation activities.

In meetings with DPP senior staff, the most frequent criticism of the project was the sub-project agreement prohibition on invoicing overhead costs. Whether justified or not, the DPP perception was that it was put at a disadvantage because it was not aware of the amount of staff time the administration of the project would take when it agreed not to charge overhead. As the real costs to DPP of undertaking the project became clear, the organization was unable to convince ORT to modify the agreement.

From the ORT perspective, DPP was receiving substantial benefit from the project since its development and commercial activities (see below) would be using the bridges, the improved roads would make travel more efficient and reduce vehicle repair costs and project vehicles and equipment used during the project would be retained by DPP at the end of the project. In addition, as discussed below, DPP has suffered from serious deficiencies in project management throughout the life of the project which necessitated substantial management training and assistance from the project. While the project anticipated providing this as a way to fulfill the second sub-project objective of institution building, it is doubtful whether USAID or ORT realized at the outset of the project the extent of management assistance and training that was required.

In an effort to minimize overhead costs to DPP, ORT provided multiple copies of all financial and technical reporting forms, paid for local transport costs for DPP work teams to reach the bridge sites, provided about \$125 per month in local currency to defray miscellaneous costs and paid per diem calculated at local rates for DPP staff when they participated in training activities. Neither other types of overhead costs (e.g. office space, utilities, depreciation of equipment, secretarial services) nor any portion of the salaries of DPP staff who supervised DPP's sub-project execution were reimbursable.

On balance, it would seem that a small overhead charge may have been justified to offset some of the administrative costs mentioned above. For local PVOs to generate and sustain a level of financial resources which is adequate for their own needs is difficult under the best of circumstances. The high rate of inflation in Zaire, the pressure this causes for salary increases and the effort to keep costs to villagers as low as possible in view

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of their meager resources all combine to tax the financial viability of the local PVO. Even though the ineffective management of its available resources was clearly a constraint on DPP activities, ORT documents also admit that DPP's financial crisis would still be serious with exceptionally good resource management. While seeking to strengthen local PVO institutional capability with one series of inputs, ORT should have made certain that the demands made on DPP's staff were not at the same time weakening the organization's capability through what they saw as the substantial real and opportunity costs of providing agreed management and reporting services. The process of determining the real overhead cost to DPP of administering the sub-project would also have provided an excellent training opportunity for DPP staff.

Finally, the invoicing of overhead costs, calculated on an agreed basis, would have put the sub-project budget structure and invoicing practices on the same footing as ORT's Cooperative Agreement with AID. This would have gone far to mitigate the evident resentment felt by senior DPP staff who - rightly or wrongly - perceive ORT as a PVO receiving 20% of the \$5 million dollar project budget for their own overhead. (The question of the real overhead costs of using ORT and ORT's cost effectiveness, is considered elsewhere.) This issue was raised during the Evaluation Team's visit to Idiofa by four different DPP staff and, as recently as March 16, 1987, Père Ribaucourt wrote to ORT that "while O97 has paid all the costs of transport, material and salaries, the DPP organization itself has received nothing and has even lost money" as a result of its participation in the project.

IT IS RECOMMENDED, THEREFORE, THAT FUTURE PVO ASSISTANCE PROJECTS IN ZAIRE BE DESIGNED TO PERMIT REASONABLE OVERHEAD COSTS TO BE BILLED BY LOCAL PVOs ONCE THEY ARE DETERMINED AND VERIFIED BY GENERALLY ACCEPTED ACCOUNTING PRINCIPLES. THEY MAY BE PART OF A LOCAL PVO'S PROJECT CONTRIBUTION BUT SHOULD BE SHOWN AS SUCH IN WRITING AND IN DETAIL.

6.2.1 DPP Personnel

One of the project's objectives has been to "upgrade indigenous PVOs". It is well worth noting that DPP is very much an indigenous organization. The Bishop of Idiofa (Monseigneur Biletsi), DPP's Executive Coordinator. Abbé Phulushi, the heads of all four DPP divisions, the head of personnel and administration, the veterinarian, the Director of COMBILIM and all other staff interviewed by the Evaluation Team were Zairian nationals. While a driving force in the development of DPP for many years has been Père Ribaucourt, a Belgian national, the organization is clearly staffed and largely run by local people.

Among its staff, DPP has a number of university graduates (from the Universities of Kisangani, Lubumbashi and Kinshasa among others) and has several former school teachers as well as Catholic clergy. Nearly all senior staff are male.

The weaknesses of DPP will be apparent in the following sections, however, it should be noted that staff interviewed by the Evaluation Mission appeared highly motivated, committed to improving the lives of local people and genuinely appreciative of the assistance provided by USAID/ORT. Abbé

Phulushi and others described and showed the Mission examples of management methods and procedures learned in ORT training seminars which had since been used in DPP reports and incorporated into DPP administrative procedures. The appropriateness and quality of ORT training is discussed elsewhere but the unmistakable enthusiasm shown by DPP staff for the content of ORT training interventions is important for USAID to note when considering whether to work with DPP in future PVO assistance projects.

6.2.2 DPP Technical, Management and Administrative Capabilities

The DPP-ORT sub-project agreement was signed because ORT correctly understood that DPP was one of the most promising and longstanding indigenous PVOs in the Bandundu area, that it could benefit from technical and training interventions and that it had adequate capability to achieve the project's proposed infrastructural development activities. In a letter dated June 5, 1984, ORT's project manager concluded:

"...while they (DPP) have not installed acrow type bridges, they have built many concrete bridges, varying from five to thirty-five meters, and obviously requiring an engineering capability equal to or greater than that needed for making abutments for acrow bridges. We were, in short, impressed by their previous and ongoing bridge work."

DPP's management and administrative capabilities have, nevertheless, been seriously deficient throughout the life of the project. The institutional weaknesses of DPP and other local PVOs were assumed in the USAID-ORT Cooperative Agreement which called for upgrading their capabilities through management assistance and training. The specific management constraints were known to ORT, to at least some extent, prior to the beginning of the DPP-ORT sub-project agreement. Therefore, the internal problems of DPP are not highlighted here to criticize DPP but to indicate the level of institutional development which existed at the start of project activities in order to trace the effect of project inputs on the achievement of project institution building objectives.

In 1984, DPP headquarters in Idiofa consisted of:

- o an Administrative Division, including an accounts and personnel department and a savings & loan association;
- o a Social Services Division, including a health center, cultural center, and library;
- o an Agriculture/Livestock Division with extension and credit services and a store offering agricultural inputs;
- o an Infrastructure Division responsible for civil engineering activities, including road and bridge construction, building construction and hydro-electrical construction and installation;

- o a vehicle maintenance workshop and warehouse.

To support its charitable and development activities, DPP was also engaged in substantial profit making commercial enterprises, including the purchase and sale of agricultural produce, management of its 3,000 head of beef cattle and operation of its retail store. Clearly, DPP has for some time understood its long term goal as self-sustaining and self-financing development focused on the rural population. To provide such social services as education and health, DPP understood it needed to generate income through the provision of services to the target population which would also allow that population to increase its own incomes. Thus the milling of grains, loaning prize cattle to farmers for studing, development of bee keeping for honey production, transport of farm produce to market and provision of agricultural inputs all serviced this purpose. In short, development was ideally conceived as a self-energizing closed circle in which DPP engaged in extension, training and community organizing to increase production and productivity while also engaging in "valorisation," processing and adding value to local produce so the profits could support DPP's activities.

DPP has obviously achieved a great deal in a region of Zaire which has great agricultural potential and a widely dispersed rural population connected by only the most rudimentary road system. Despite this, ORT concluded in 1984 that:

- o DPP suffered from a lack of planning and a lack of planning capability;
- o DPP suffered from an ad hoc financial management and bookkeeping system (no accounts ledger, no payment vouchers, no petty cash control system, inadequate budgeting systems, etc.)
- o DPP suffered from an inadequate materials procurement and distribution system (no purchase orders, no stock cards, no overall inventory control, no regular planning for stock maintenance, etc.)
- o DPP staff had not had formal management training;
- o DPP's division of responsibilities, levels of decisionmaking, job descriptions and related management procedures were deficient or unclear;
- o DPP's development and commercial functions appeared to be confused.

Many of these deficiencies were apparent to DPP but they were viewed as either unavoidable given the context in which DPP works or as a criticism which measured DPP's management against an abstract and somewhat academic ideal rather than against the overwhelming development challenges confronted by the organization. Père Ribaucourt, for example, described DPP as "engaged in a war or perhaps a guerrilla conflict where one rarely has the luxury of developing a minutely prepared plan of attack but rather is forced to avoid defeat using the most limited means." He pointed out that the editor of the journal Zaire-Afrique in an article on DPP commented, "given current conditions (in the country), it is quite astonishing that you are able to continue your work at all."

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The reaction that admits institutional weaknesses and ascribes them to inadequate resources or insufficient staff time or organizational crises caused by external factors is not unusual. The important point and the one used by ORT to engage in long term institution building is that DPP did recognize its management weaknesses and began to make piecemeal changes as ORT supplied forms for record keeping, financial reporting requirements and other tasks that were limited and specific to the execution of the infrastructural part of the sub-project. ORT then built upon these initial requirements as outlined in part 6.3.2 below.

In early 1985 the diocese created a new non-profit entity called COMBILIM (1) which it planned to use as the institutional vehicle for all commercial activities. In order to obtain non-profit status, the objectives and responsibilities of COMBILIM were defined in a way that confused and sometimes duplicated its functions with those of DPP. This initiative seems to have compounded the management problems faced by DPP while also contributing to a decline in staff morale.

On the whole, DPP's management and administrative constraints could be said to be an important factor inhibiting DPP's ability to achieve its development goals. These constraints also affected the implementation of the DPP-ORT sub-project and made regular and frequent ORT supervision necessary to assure timely bridge and culvert installation.

6.2.3 DPP Performance

DPP assigned four teams to the sub-project to construct abutments at the bridge sites and perform related preparatory work. Each team included two masons and from eight to twelve laborers. In addition, DPP provided two teams to install culverts. The quality of the workmanship is evaluated in the engineering report (Annex 3) where it has been judged of good quality. DPP performed well in that it was able to provide the labor required for this aspect of the project's activities.

DPP's performance in the area of cooperation with other organizations involved in road and bridge construction and maintenance is also rated favorably. DPP worked closely with the GOZ Office des Routes without difficulty (See part 6.5 below) and it maintained good relations with CODAIK, a World Bank financed parastatal activity which is involved in road maintenance in the region.

As noted above, DPP's overall management performance left much to be desired, however, the improvement in numerous areas in the past year gives cause for considerable hope that a stronger, better managed Zairian PVO is now available to work with USAID and/or other donors in the future. The Evaluation Mission believes that DPP's recent progress, its undeniable long term commitment to the people of the diocese and its established human infrastructure in the villages, at the parish level and at DPP and COMBILIM make it one of the most promising indigenous organizations in the Bandundu region. The Mission would recommend that USAID continue to work with DPP on USAID projects 098 and 102 as planned.

(1) COMBILIM is located about three miles from DPP and has its own impressive infrastructure including a large warehouse with substantial rice and manioc milling capabilities, a new office block, a carpentry shop, its own water and hydro-electric systems in place, a cattle dipping station, residences and support structures. It receives most of its assistance from MISEREOR.

6.3 Review of ORT Inputs to the Sub-Project

6.3.1 Procurement of Materials, Supplies and Equipment

A general discussion of ORT's procurement system and performance appears in part 3.4 above and a technical assessment of the suitability of the items which were procured is included in the engineering report (Annex 3, section on civil engineering).

6.3.2 Management Assistance

The DPP-ORT sub-project agreement recognized DPP's management assistance needs in the Condition Precedent (E.7) which mandated that ORT would conduct an assessment of DPP's institutional capabilities to make specific recommendations to upgrade the organization's management performance. The first such analysis was completed in April 1985 by ORT. The findings of that report were reinforced by the Mid-Term Evaluation which recommended that a more in-depth diagnostic evaluation of the diocese, DPP and COMBILIM to recommend possible revisions to the organizational structure as well as management policies and procedures. USAID pointed out that structural reorganization of a PVO was beyond ORT's terms of reference. Consequently, ORT, with the assistance of CIDEP/CPA (an interdisciplinary center located in the Ministry of Education of Zaire), prepared an assessment of management training needs. That report, in turn, led to a further analysis in early 1986 to draw the attention of diocesan leaders to fundamental organizational difficulties and training needs.

ORT skillfully used the by then agreed upon package of training interventions to help diocesan and DPP leaders to understand their more fundamental organizational and conceptual problems by role playing and developing fictional development organization models for implementation of community level assistance in sectors similar to those in which DPP is involved.

Rather than going beyond its terms of reference or directly confronting DPP with a proposal for its reorganization, ORT took the more time-consuming but ultimately more successful approach of helping DPP to reach its own conclusions about its organizational structure while attending a series of five management training seminars. Once the diocese and DPP staff understood the full range of their conceptual and institutional difficulties, ORT then held a series of three workshops to respond to their felt need to evolve a new institutional relationship. The "facilitation workshops" were held in Idiofa in April, 1987.

The final facilitation workshop achieved a consensus on a new organization chart defining the responsibilities of the various entities. It also reached agreement on measures to be taken to implement the decisions. Of particular note, is the fact that the two ORT facilitators at the final workshop were both Zairians: Dr. Ngay Aben, a management specialist and Cit. Tabaro Tchim, the management training specialist employed by ORT/Kinshasa. ORT is to be

commended for having evolved its own management assistance program to the point where an all Zairian assistance team was able to complete a long term process of management assistance interventions with an all Zairian staff of a local PVC.

The three facilitation workshop reports were able to establish a clear agreement on the purpose and objectives of the three entities, the functional and hierarchical relationships among them and the preferred expression of these conclusions as represented in an agreed upon organization chart. Major recommendations from this exercise are:

1. All commercial activities are to be transferred to COMBILIM, leaving DPP to concentrate on its original purpose, the organization and education of the rural population.
2. As a profit-making entity, COMBILIM's purpose is to finance the development activities of DPP which will prepare a development plan setting out specific goals and objectives. Annual budgets and workplans will be reviewed and approved by the Conseil Général of the diocese.
3. The legal status of COMBILIM will be revised to bring it under the control of the diocese.
4. Policy making will be separated from management and administration. A separate policymaking body will be set up for COMBILIM and DPP and these will be overseen by the diocese's Conseil Général.
5. DPP will work to decentralize the delivery of services to the parish level while increasing the participation of the intended beneficiaries of the services.

During the effort in 1986 to help achieve a consensus for new institutional relationships among the diocese, DPP and COMBILIM, ORT was also working on the parallel track of providing technical management interventions in the various administrative areas of these entities.

1. ORT used the American PVC Technoserve on a consulting basis to prepare an accounting system for the diocese in two volumes: a chart of accounts and a guide to its use and rationale.
2. ORT used the local research groups CIDEP/CPA to produce two reports to guide the management and management training interventions which occurred in 1986. They contained the responses to a detailed questionnaire which yielded valuable information both about the local PVCs capabilities and needs and about the opinions and attitudes of its staff. Both reports were well done and provided the baseline data needed to set up appropriate training interventions.
3. ORT provided regular guidance to various parts of the DPP organization regarding the proper completion of reports in the areas of finance, inventory, project progress, etc.

ORT's approach to management assistance has been to tie the action components of sub-project activities to the institutional development interventions so that DPP personnel would be able to apply the theoretical aspects of management to the daily requirements of project execution. The inputs described above have largely occurred within that conceptual framework as have the training inputs discussed in Annex 2.

6.3.3 Training Inputs

To assure a more thorough evaluation of the project's training inputs, a separate annex on training is attached as Annex 2. The Annex reviews the training approach and methodology and reviews it for appropriateness, examines the five management training modules used by ORT to provide training to diocese, DPP and COMBILIM staff and considers the quality and source of training materials, the abilities of the trainers and the results of the training which was provided.

6.4. Review of Sub-project Outputs

6.4.1 Road and Bridge Rehabilitation

As of April 30, 1987 seven of the nine Acrow bridges had been installed and the other two were under construction. ORT estimates they will be completed within four to six weeks. The project has completed 100% of the culvert installations and 25% of the drainage system improvements. For an analysis of the outputs in this area, please see the engineering report appended as Annex 3.

6.4.2 Management Development (Institution Building)

As a result of ORT management development interventions, the following project outputs may be enumerated in this area:

1. DPP Accounting Practices are Strengthened

ORT supplied a) payment/credit voucher forms, b) petty cash vouchers, c) general accounts ledgers, d) petty cash transaction book, e) a written explanation of each form and a site visit by an ORT staff person to answer questions about proper accounting, f) written regulations on bank transactions and how to use/retain invoices, receipts, bank statements and Bon de réception, g) separate regulations for cash transactions since checks are not useful in many rural areas, h) training on submission of monthly financial reports with appropriate supporting documentation, i) an explanation of the use of the monthly financial summary form, j) a framework for preparation of quarterly budgets, k) regular review of compliance with accounting procedures.

Since DPP's accounting habits had grown over a twenty year period on an as needed basis, ORT also had to fit project accounting requirements into existing accounting habits and slowly modify procedures to develop a more coherent system.

2. DPP Planning Capability is Strengthened

ORT required preparation of a quarterly work plan for the last quarter of 1984 and annual workplans thereafter which conformed to project budgets and objectives. ORT assisted DPP in formulating these plans and reviewed them periodically. Clearly, project planning techniques used by ORT and taught in the management training seminars have been used by DPP staff.

3. Diocese/COMBILIM Institutional Relationship Clarified

As explained above, a consensus has been reached among DPP, COMBILIM and the diocese regarding the respective areas of competence of these entities. This consensus, coming at the end of the PVO Economic Support Project, offers a framework for further assistance.

4. DPP Materials Procurement, Distribution and Inventory Systems Strengthened

ORT technical interventions in the development of an integrated system of commodity procurement, distribution and control has yielded an appreciation within DPP of the importance and usefulness of such items as "fiches de contrôle" and stock item numbers.

5. DPP Management Capability Strengthened

Several DPP staff spoke with enthusiasm of the new management techniques they are now employing in their positions. The 1986 DPP Annual Report for the first time contained a carefully elaborated "logframe", a timeline chart showing planned inputs and other charts that will help monitor and manage DPP activities. For the first time, each sub-region and each parish has been assigned a code and each project within a parish has a code to better track all DPP activities in the diocese and to establish a numbered file system. Management skills included MBO (Management by Objectives), working in Task Forces, using problem solving methods, decisionmaking, etc.

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6. DPP Overall Efficiency Enhanced

In management development, the whole often equals more than the sum of its parts. The various elements described above are combining to give DPP a more rigorous structure that should yield more effective use of staff time, more accurate data, better teamwork and a general increase in institutional effectiveness.

The achievements enumerated above are real and substantial, however, they are also fragile and recently acquired. To assure their long term sustainability, further management assistance should be provided over the next few months at a minimum. The foundation for a much more efficient organization has been laid but the recommendations in Annex 6 clearly remain important.

6.4.3 Training

For an assessment of the outputs in the training area in terms of the training modules used, quality of trainers, number of persons trained and at what levels, etc, please see Annex 2.

6.5 Cooperation with the Office des Routes (OR)

In mid 1984 the Office des Routes in Kikwit promised to send engineering teams to each of the proposed bridge sites to design the necessary plans for abutments and related work. OR also promised to install all the bridges at the proposed sites. No fee was charged for the design work or bridge installation and no funds were paid to OR for any activities they undertook on behalf of the project.

OR is responsible for the maintenance of the transport infrastructure in the project region. Since it has very limited financial resources, the OR has established a system of road classification and has a set of road maintenance priorities based on volume of usage and strategic importance. The DPP-ORT sub-project, on the other hand, has its priority focused on farm to market rural feeder roads which, if improved, should facilitate the movement of surplus agricultural commodities to the large Kinshasa market.

Interviews with DPP personnel revealed that, although OR was sometimes slow to respond to their requests, they did launch the bridges and do the design work as promised. DPP and ORT have praised OR for its assistance to the project.

During a meeting with the Evaluation Team, OR stated that a Belgian financed project has been mounted to stabilize the bridge access areas through the re-construction of the cement access ramps using soil-cement stabilization. The project will begin once the cement arrive in the port of Matadi and is transported to the Bandundu area. The USAID financed bridges may be reinforced with these access ramps according to the OR

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director or through assistance from another ongoing USAID project. OR also has a proposal pending before the World Bank to establish a National Feeder Roads Maintenance Service in the Ministry of Agriculture.

OR visited all sites before and during the bridge launchings, which can take from 3-10 days to launch depending upon the size of the bridge. OR was appreciative of USAID's support in the region but appealed for assistance in road maintenance as well arguing that the bridges would only be used by farm commodity haulers if the roads were passable.

6.6. The issue of user Fees

The Cooperative agreement between USAID and ORT states that one of the sub-project's objectives is to "create locally raised revenues for road and bridge maintenance so that these projects can become self-sustaining." In addition, ORT was to "look into the feasibility of using villagers for road maintenance activities." In brief, no progress has been made toward the achievement of this objective.

ORT prepared a report in early 1987 titled "Self-Sustaining Road Maintenance" in an effort to satisfy this component of the Cooperative Agreement. The report examines the current methods used to maintain roads in Zaïre, discusses the cost of roads maintenance and the findings of recent studies by ILO and DAI. The report concludes, correctly, that in Zaïre the Government would be required to approve any revenue generating measure and may well insist on acting as the collecting agent as well.

The GOZ considers road maintenance a public service and collects a general fuel tax for road maintenance(1) and is opposed to user fees collected at toll booths. This approach would, in any case, be difficult to monitor and would create opportunities for abuse of both the system and the travelling public. Another suggestion has been the sale of licenses to commercial vehicles with the fees used for road maintenance but it cannot be assumed that fees raised in this manner would be used as planned. A final suggestion was to explore the use of the parastatal organization, CODAIK, as a collection agent of licensing fees since that might address the GOZ's concern that it control revenue raising activities while at the same time having a more decentralized mechanism whereby revenues raised would remain closer to the area where the funds would be spent for maintenance. There are, however, questions about CODAIK's performance as well.

The issue of user fees is beyond the ability of ORT or the sub-project to solve. The Evaluation Team believes ORT made a good faith effort to address this part of its Cooperative Agreement through the preparation of the report mentioned above. Since this issue is a serious one that affects the long term viability of a number of road improvement activities, the mission:

RECOMMENDS THAT THE ISSUE OF USER FEES BE TAKEN UP AT THE DONOR LEVEL IN ORDER TO PROPOSE TO THE GOZ A JOINT APPROACH TO THIS ISSUE. AN EFFECTIVE USER FEE SYSTEM MIGHT BE MORE READILY DEVELOPED IF ITS IMPLEMENTATION WERE LINKED TO OVERALL DONOR INFRASTRUCTURE DEVELOPMENT PACKAGES. USAID SHOULD AVOID INSERTING ESTABLISHMENT OF LOCAL USER FEE SYSTEMS AS A PROJECT DELIVERANCE UNTIL THE ISSUE IS RESOLVED AT THE POLICY LEVEL.

6.7. Recommendations

1. DPP HAS RECENTLY REACHED A CONSENSUS ON ITS REORGANIZATION. DPP NEEDS FURTHER MANAGEMENT ASSISTANCE. IN VIEW OF THE PROGRESS ACHIEVED BY DPP, THE MISSION RECOMMENDS THAT ORT BE PERMITTED TO PROVIDE SHORT-TERM MANAGEMENT HELP THROUGH THE PACD (9/30/87) TO INSTITUTIONALIZE THE CHANGES WHICH HAVE BEEN MADE. IF NECESSARY, ADDITIONAL COUNTERPART FUNDS COULD BE MADE AVAILABLE TO HIRE LOCAL CONSULTANTS TO ASSIST THE MANAGEMENT TRAINING SPECIALIST (CIT. TABARO) STILL EMPLOYED BY ORT/KINSHASA. THE MISSION REQUESTED THE ORT PROJECT MANAGER TO PREPARE A BRIEF PROPOSAL FOR THIS PURPOSE. IT APPEARS AS ANNEX 6. A TRANSITION TO POST-PACD SHOULD ALSO BE EFFECTED DURING THIS PERIOD POSSIBLY WITH INPUT FROM USAID PROJECT 098.

2. IN VIEW OF THE IMPENDING START UP OF USAID PROJECT 102, THE PROJECT SHOULD GIVE FULL CONSIDERATION TO DPP'S REQUEST FOR A LONG TERM AGRICULTURAL EXTENSION TRAINER TO BE BASED AT DPP/IDIOFA TO STRENGTHEN DPP'S EXTENSION ASSISTANCE CAPABILITY.

3. ONE OF THE WEAKEST SECTIONS OF DPP WAS CLEARLY THE "SOCIAL SERVICE" DIVISION WHICH IS ESSENTIALLY A "WOMEN IN DEVELOPMENT" EFFORT. CITNE. NGABO HAS ALMOST NO RESOURCES TO USE IN HER CIRCUIT VISITS TO VILLAGE WOMEN WHERE SHE TRIES TO TRAIN THEM IN HYGIENE, NUTRITION, FAMILY PLANNING THROUGH CHILD SPACING, ETC. THE EVALUATION TEAM STRONGLY RECOMMENDS THAT ANY FUTURE PROJECT WITH DPP PARTICIPATION HAVE THE DESIGN TEAM EXAMINE THE ROLE OF WOMEN IN ALL ASPECTS OF PROJECT DESIGN AND CONSIDER WHETHER A DISCRETE COMPONENT FOR WOMEN WOULD BE APPROPRIATE.

(1) The World Bank Transport Sector Memorandum (June, 1986) points out that road users pay about 80% of the marginal cost of user charges while truckers pay about 50%. The Bank recommends an increase in axle-load tax on trucks, an increase on the tax of diesel fuel and a road tax on tires. These actions are at the national level and would accrue to the benefit of such major farm-to-market highways as Kikwit-Kinshasa. Project 097 was responsible for considering road user fees on local farm-to-market feeder roads with lower priority classifications. It is in this area that ORT has been unable to develop a system of road user fees since decisionmaking on this issue remains at the policy level.

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VII. The Koda Hydroelectric Sub-project

7.1 Introduction to the Koda Sub-project

The primary purpose of this sub-project is the construction of a 300 KW hydroelectric facility at the Koda river falls in order to provide an adequate supply of electrical power to the Rethy Mission and Kwandrumsa village in the region of Haut Zaire. The secondary purpose of the project is to test the economic and technical feasibility, the cost effectiveness and the efficiency of using a professional firm to implement the technical work. Finally, the sub-project was intended to test whether a rural community hydro facility can become self-financing and self-sustaining.

On October 16, 1984 a sub-grant agreement was signed between ORT and the Administrative Council of CECA (Le Communauté Evangelique au Centre de l'Afrique) which obligated the amount of \$902,475 and Zaires 17,992,795 for the purpose of establishing and managing the mini hydroelectric scheme. A contract was also signed between CECA and a technical design and construction consortium (BETEC/DWV/ACEC) to build the facility.

A discussion of the construction contractor selection process as well as a thorough technical assessment of the electrical and civil engineering aspects of this sub-project will be found in Annex 3. An analysis of the degree to which the quantifiable project purpose (construction of the hydro facility) has been achieved and whether the chosen mode of implementation has been found technically sound, efficient and cost effective is also included in Annex 3. Finally, a review of ORT's management of the technical aspects of the project are found in Annex 3. Comments on the training element are offered in Annex 2. The following design, management and administrative issues will be addressed below:

- 7.2 Non-technical aspects of the management of the sub-project by ORT and CECA
- 7.3 Performance of the technical contractor consortium (BETEC/DWV/ACEC) in non-technical areas
- 7.4 Assessment of the distribution of sub-project benefits
- 7.5 Assessment of the proposed management structure of the hydroelectric facility
- 7.6 Prospects for the sub-project to become self-financing (user fees)
- 7.7 A review of project outputs

Before turning to these more specific concerns, a word might be said about the decisionmaking process within AID which led to the inclusion of this sub-project within the PVO support project. From discussions with USAID staff, it was learned that the USAID engineer carried out some pre-design feasibility studies and USAID recruited a Protestant missionary from Karewa to consider the appropriateness of the Koda/Rethy site.

For a hydro scheme to be economically viable, it requires a minimum nexus of economic activity to justify its capital costs and cover operational costs. It also must be managed by some reliable existing entity or one established expressly for that purpose. The Evaluation Mission was told by the USAID project officer, "when USAID thinks PVO, it thinks missionary." To the extent this is true, other economically viable locations in Zaire where there are no American missionaries, may not receive equal consideration for assistance. In the future, USAID should ensure that all potential areas for hydro development are reviewed, that if missionaries are used as consultants to consider other missionary sites their objectivity should be verified, that comprehensive technical socio-economic baseline data be obtained before a decision to proceed with construction is made for a given location and that prior experience at other hydro sites is available for reference.

The Evaluation Team is not, repeat not, arguing that the Koda Falls scheme should not have been built. Rather, the comprehensiveness of the data used to decide to build the scheme at that location and the extent to which possible options were considered where Zairians may have benefitted to a greater degree are being questioned. It may be argued that the pilot nature of the scheme makes such thorough background investigation unnecessary since a major objective of the scheme was to generate data, however, the scheme itself should also be able to demonstrate both economic viability and OPTIMAL benefit to the Zairian community. Whether the Zairian community will benefit optimally remains an open question as the rate structure and distribution of benefits is finalized with the help of NRECA. As the remainder of this section stresses, however, the Evaluation Team is concerned at several signs indicating that this may not end up to be the case.

7.2 Non-technical Aspects of the Management of the Sub-project by ORT and CECA

The direct responsibility for monitoring and managing this sub-project has been retained by the ORT project manager throughout the life of the project. This has been the most difficult of the three sub-projects to manage since it is physically remote from the ORT office in Kinshasa, communications are unreliable between Kinshasa and the sub-project site, and there are more institutional actors and fewer precedents for the Koda project. As discussed in Annex 3, the inadequate management of the engineering consortium (BETEC/DVV/ACEC) and the near bankruptcy of DVV during the sub-project execution phase has caused significant construction delays. It has also required a greater proportion of the ORT project manager's time and attention than should normally have been the case.

A thorough review of the correspondence among the various institutional actors (USAID, ORT/Washington, ORT/Kinshasa, CECA/Bunia, CECA/Rethy and BETEC/DVV/ACEC), a review of the basic sub-project documentation and interviews of key personnel in Kinshasa and Rethy was

completed by the Evaluation Team. On the basis of this review, the Team has concluded that, on the whole, ORT/Kinshasa's management of this sub-project has been commendable. The delay in project execution has largely resulted from factors beyond the control of ORT. More precisely:

- o ORT/Kinshasa's project files were complete, well-organized and thorough in their treatment of the principal issues considered by the Mission;
- o During the Mission's visit to Rethy, ORT/Kinshasa's project manager demonstrated a clear ability to handle difficult contract negotiations with sub-contractors in French;
- o Regular site visits were made to the sub-project area by the project manager;
- o The working relationship between the ORT project manager (Mr. Leslie Fox) and the CECA sub-project coordinator (Mr. Paul Brown) was correct and professional;
- o The ORT project manager displayed a thorough knowledge of the legal, contractual, managerial and administrative issues and had sufficient knowledge of the technical issues to know when outside technical expertise was required (e.g. the NRECA consultancies) and what technical questions to ask of the various parties;
- o Procurement waivers were submitted to USAID as required and a waiver was obtained permitting a contract to be signed with a non-U.S. contractor;
- o Regular reporting to USAID on sub-project progress and problems occurred and is documented;
- o Regular audits were performed by the ORT project manager during site visits and accounts were reconciled;
- o The GOZ Department of Energy and SNEEL have been kept informed of project progress and legal documents regarding the establishment of the Koda hydro authority are now being prepared.

While there is much to commend in ORT's management of the sub-project, there was a tendency to focus on the technical aspects at the expense of the institution building and training aspects. This is understandable given the major construction delays and the primary project objective of completing the physical hydro infrastructure on time and within budget. Nevertheless, the sub-project is now faced with certain non-technical difficulties as a consequence.

More precisely, according to the April, 1985 NRECA study, there are more potential electricity consumers in the area than can be served by the planned Koda generator or by the amount of distribution line funded. The Project Proposal anticipated this and makes reference to the Koda hydro committee

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(composed of the Chief of the Zabu Groupement - which includes the Kwandrums community and surrounding villages, two Kwandrums businessmen, two members of the CECA church and two missionaries) as the vehicle which "will enable the open exchange of ideas and will ensure the proper management of the consumer tariff system." The Project Proposal also states that "At the local level, the Council's (i.e. the CECA/Bunia Advisory Council) representative is the Koda hydro committee which is composed of representatives from the Rethy mission and Kwandrums community." It is the clear intention of the Project Proposal that the Zairians living in Kwandrums and nearby areas should have a voice in the planning and management of the hydro facility.

In an interview with the CECA project manager, it was learned that the Koda hydro committee has not met in more than a year. The CECA project manager stated that the committee had "no standing" and has, in effect, been superseded by a CECA church committee devoid of any representation from the Kwandrums area. The decision to supplant the committee, whose composition was listed in the Project Paper, for a wholly church committee was apparently a unilateral one by CECA. Interviews with the Kwandrums representatives of the now defunct committee revealed a high level of resentment and considerable misunderstanding about the sub-project's purpose, intended beneficiaries and probable rate structure. While the CECA management can be directly faulted in this instance, closer supervision by ORT should have detected the growing exclusion of Kwandrums from participation in project activities and sought to reverse it.

Discussions with the CECA project manager revealed a propensity to minimize participation by the Kwandrums community and to view the project as one which is and will remain CECA owned, managed and directed. While the NRECA report of April, 1985 recommends that ownership and control of the facility remain under CECA (and this recommendation is not questioned by the Mission), it is the clear intention of the Project Proposal and of USAID that the local Zairian community have meaningful participation during the planning and construction phase and in the supervision of the completed facility.

IT IS RECOMMENDED, THEREFORE, THAT THE ORT PROJECT MANAGER CONVENE AND CHAIR A CAREFULLY PREPARED JOINT MEETING OF CECA SUB-PROJECT PERSONNEL AND REPRESENTATIVES OF THE KWANDRUMS COMMUNITY TO BE HELD IN KWANDRUMS VILLAGE. THE AGENDA OF THE MEETING SHOULD INCLUDE A DISCUSSION OF THE CURRENT STATE OF SUB-PROJECT PROGRESS, A REVIEW OF USER FEE RATE OPTIONS AND A DISCUSSION OF THE ROLE OF KWANDRUMS REPRESENTATIVES IN CURRENT SUB-PROJECT ACTIVITIES AND THE FUTURE MANAGEMENT STRUCTURE OF THE HYDRO FACILITY. FURTHER, THE ORT PROJECT MANAGER SHOULD SPEAK WITH THE CHIEF OF THE ZABU GROUPEMENT TO DETERMINE IF THE CHIEF WOULD WISH TO HAVE A PUBLIC "TOWN MEETING" WHERE ALL THOSE INTERESTED IN THE PROJECT COULD MEET AND HAVE THEIR QUESTIONS ABOUT THE HYDRO FACILITY ANSWERED. SINCE MANY LOCAL PEOPLE SPEAK MORE SWAHILI THAN FRENCH, THE ORT PROJECT MANAGER SHOULD BE ACCOMPANIED BY ORT'S MANAGEMENT TRAINING SPECIALIST, CIT. TABARO, WHO IS FLUENT IN BOTH SWAHILI AND FRENCH.

The Evaluation Team believes that a frank and open exchange of ideas between CECA and the local community which surrounds the mission station will contribute to a more positive environment which should, in turn, increase the understanding and participation of the Kwadruma community in the sub-project while also helping the CECA mission to be more aware of the concerns of its neighbors. To ensure continued involvement of Kwadruma in the sub-project, the Mission further:

RECOMMENDS THAT ORT URGE (AND IF NECESSARY REQUIRE) CECA TO HOLD REGULAR MONTHLY MEETINGS WITH KWADRUMA REPRESENTATIVES UNTIL THE FACILITY IS FULLY OPERATIONAL. THEREAFTER, IT IS EXPECTED THAT THERE WILL BE ONE VOTING MEMBER FROM KWADRUMA ON THE PROPOSED NINE VOTING MEMBER KODA HYDRO BOARD OF DIRECTORS. IT IS ALSO RECOMMENDED THAT ORT AND CECA CONSIDER THE UTILITY OF ESTABLISHING A UNIFIED CECA-KWADRUMA COMMUNITY ADVISORY COMMITTEE OF ELECTRIC CONSUMERS TO MEET QUARTERLY FOR THE PURPOSE OF CONSIDERING THE EFFECTS OF BOARD DECISIONS ON CONSUMERS. THE JOINT COMMITTEE WOULD HAVE NO LEGAL STANDING BUT IT WOULD OFFER A REGULAR FORUM IN WHICH BOTH MISSIONARY AND KWADRUMA CONSUMERS WOULD BE ABLE TO DISCUSS THEIR CONCERNS WITH EACH OTHER ABOUT SERVICE, PRICES, SAFETY, ETC.

While such a unified community advisory committee might question the management of the Koda facility on a range of issues, it is preferable in the long run to maintain a frank and honest dialogue among all electricity consumers than to have problems ignored and allow resentments - whether justified or not - to grow and fester.

A second area requiring greater ORT supervision and management is in the recruitment and training of local personnel. An assessment and discussion of the training thus far provided to the CECA project manager (Paul Brown) in the United States and the local training of electricians, the bookkeeper and other staff appears in Annex 2. There are four aspects of recruitment and training which have management implications.

First, as of May 1, 1987 CECA has not prepared an overall training plan for the sub-project which indicates the number of people who need to be trained, their level and duration of training, where it can be obtained, etc. While some local training has been undertaken informally at the Rethy mission, ORT should require the submission of a training plan as soon as possible.

IT IS RECOMMENDED THAT ORT REQUEST A COMPREHENSIVE TRAINING PLAN FROM CECA FOR ALL LOCALLY HIRED PERSONNEL TO BE SUBMITTED TO ORT NOT LATER THAN JUNE 15, 1987.

Second, in a discussion with the CECA project manager about the recruitment of a Koda hydro facility system manager, he indicated that CECA believes it is still too early to recruit one. The April, 1985 NRECA report stated (p. 26) that "CECA should select an Interim Manager during the present construction phase and begin (at that time) a search for a permanent manager." As of May 1, 1987, over 60% of the construction of the hydro facility had been completed and estimates of the time needed to complete the system

range from four to eight months. The Mission does not agree with CECA's position and urges CECA to begin looking for a manager at once. Filling this position is made more urgent by the fact that the CECA project manager is leaving for the U.S. for 12 months in July, 1987. By his own estimation, no more than about 15% of the skills he learned on his ten week USAID-funded training program in the United States has been transferred to anyone else in Rethy. Had a system manager been recruited by now, and had a training plan been developed earlier, there would have been more opportunity for such a transfer of knowledge.

IT IS RECOMMENDED, THEREFORE, THAT A HYDRO SYSTEM MANAGER BE IDENTIFIED AND APPOINTED BY JUNE 15, 1987.

Third, the CECA project manager expressed the strongest preference for a missionary to occupy the post of system manager and resisted suggestions that an effort be made to identify Zairian candidates. He indicated that this is also the position of CECA/Bunia. In view of this, the Evaluation Mission believes that USAID and ORT should consider either urging recruitment of a Zairian manager or urging the establishment of a counterpart position to be occupied by a Zairian who would work with and in support of the missionary system manager. Although ownership and management of the hydro facility is scheduled to be turned over by AID to CECA, AID and ORT may be able to use their influence and leverage to create an opportunity for eventual Zairianization of the system manager position.

IT IS RECOMMENDED, THEREFORE, THAT USAID, ORT AND CECA EXAMINE THE POSSIBLE MEANS BY WHICH THE KODA SYSTEM MANAGER POSITION MAY EVENTUALLY BE ZAIRIANIZED.

Fourth, the CECA project manager clearly indicated that there is a religious test for employment of Zairians in the hydro facility. The CECA project manager was asked, for example, whether a Catholic or person holding any religious views other than those of CECA could be hired as a bookkeeper or utility operator. The CECA project manager answered that CECA would only hire those who demonstrated a "good moral standard." When asked whether Catholics or others could be so defined, he stated that he believed that they could not. The Evaluation Mission has reviewed both the sub-grant project agreement (AOF-0097-A-84) and the Standard Provisions for Non-U.S., Nongovernmental Grantees and Nongovernmental Subgrantees and can find no provision barring religious discrimination in employment in U.S. government financed projects executed in this manner. Neither was any reference found to the incorporation by reference of any General or Additional General Provisions of AID which do contain such a prohibition.

Therefore, the Evaluation Team:

1. RECOMMENDS THAT AID INVESTIGATE WHETHER THERE IS A MEANS TO HOLD SUB-GRANTEES TO THE SAME REQUIREMENTS AS GRANTEES WITH RESPECT TO THE PROHIBITION ON ALL FORMS OF EMPLOYMENT DISCRIMINATION (RACE, GENDER, RELIGION, ETC.).

2. USAID AND ORT SHOULD WRITE TO CECA ENCOURAGING THEM TO RECONSIDER ITS POSITION AND ADOPT A STATEMENT IN ITS ARTICLES OF INCORPORATION OR BY-LAWS FOR THE KODA HYDRO FACILITY GUARANTEEING THAT THE PRINCIPLE OF EQUAL EMPLOYMENT OPPORTUNITY BASED SOLELY ON MERIT WILL BE OBSERVED.

On a technical level, as discussed in Annex 3, the management of the Koda sub-project by the CECA project manager has been excellent. His knowledge of project requirements, organization of the delivery of equipment and supplies, cooperation with Mr. Haesevoets (ACEC and construction consortium representative) and other sub-contractor supervisory personnel and his evident enthusiasm for bringing this project to fruition are to be commended.

7.3 Performance of the Technical Sub-Contractor in Non-technical Areas (BEIEC/DVV/ACEC)

A thorough discussion of the technical performance of the sub-contractor and the causes of delay in sub-project execution are contained in Annex 3. The primary constraint was DVV's poor performance and eventual bankruptcy, however, the association of contractors also clearly suffered from poor management.

Typical of two years of comments in ORT reports on this sub-project is that of the ORT project manager in his trip report of September 10, 1986:

"It is evident that the Association meets neither in Kinshasa nor at the site to plan and coordinate its activities. ACEC being the lead member has not fulfilled its role in managing the overall project."

ORT then provided a detailed list of specific actions for the Association to take and defined precisely what constituted 60% completion of the work. The Association was informed that if 60% was not completed by the end of November, 1986, ORT would consider breaking the contract for non-performance. As it turned out, the 60% point was only certified to have been reached during the Evaluation Mission's visit to Rethy on April 30, 1987.

Clearly, ORT could have broken the contract for non-performance. This option would have delayed construction even more as a new contractor was sought and new contracts signed. ORT chose to use the threat of contract termination to try to force the Association to greater effort. By April, 1987 ORT had re-gained the "driver's seat" in that it could now impose new conditions precedent on the Association before paying the next 30% of funds for the remaining construction activities.

In the meeting of April 30, 1987 ORT imposed five conditions precedent which would need to be met before additional funds would be released. These are:

1. Revision of the ORT-Association contract dropping DVV from further participation;
2. Payment to the on-site foreman (Mr. Bixhain) for 18 months of unpaid back wages;
3. Preparation of a detailed workplan showing the timing of inputs through Sept. 30, 1987;
4. Correction of deficiencies in the conditions of employment of local unskilled labor;
5. Receipt by ORT of a copy of the Association's paid up all risks liability insurance.

The quality of the Association's management in non-technical areas can only be described as appalling and as having contributed substantially to the delays in project execution. Attempting to work with the Association was clearly a most frustrating experience for ORT since ORT had few options but to continue to cajole and pressure the Association to perform. Despite this, it is hard for the Evaluation Mission to see what else ORT could have done to rectify the situation once the Association had a signed contract and had begun construction.

There is one management issue which relates to ORT and CECA supervision of the Association which merits special attention. This is the question of the conditions of work under which the sub-contractor's manual laborers were observed to be working. The Project Proposal states on page 11 that "the construction activities will benefit local labor." This premise needs to be examined in light of the reality observed by the Mission.

For the past two months, about 100 local laborers have been working about 315 feet below the Koda Falls dam in order to blast and remove a solid rock outcropping and create a solid foundation for the hydro turbine housing. The location is about 7,000 feet above sea level. The workday is from 7:00 a.m. to 3:00 p.m. daily plus four hours on Saturdays. Wages are 42 Zaires (0.38 U.S. cents) per day with no other benefits and, according to the on-site foreman, there has been no salary increase in 12 months. (Prior to preparing the turbine housing area unskilled laborers were used for other construction activities). Local informants claimed the going wage in the area for unskilled labor is 40-60 Zaires per day with benefits or about 100 Zaires per day without benefits. The Belgian ACEC work foreman on site admitted that the wage needed to be revised upward, especially in view of the rapid inflation rate in Zaire.

Further, it was observed that:

- o men were using electric powered jackhammers without protective goggles or ear protectors;
- o men were breaking boulders with sledge hammers in their bare feet and with only sandals since no work boots were provided;
- o despite the 600 foot very steep drop and falling rocks, no hard hats were provided;
- o men were lifting, hauling and tossing rocks with no protective work gloves;
- o no first aid kit was available at the work site below or at the upper level;
- o no drinking water (clean or otherwise) was provided on the worksite.

When this was brought to the attention of the CECA project manager by the Evaluation Mission team leader, he stated "They're used to working like that. Basically, if they don't like the conditions, they don't have to work." As for drinking water, the Mission was told that the workers could climb the 600 feet to the dam and hike another five minutes or so to the edge of the diverted Koda falls and drink from the river. When the question of injuries was raised, both the CECA project manager and the ACEC foreman on site thought the current situation was acceptable wherein the injured man would be carried or would walk to the top of the construction site and be taken to the hospital in Rethy for treatment. It was admitted that there have been several injuries on site from falling rocks and a serious leg wound caused by a sharp rock. When it was suggested that a first aid kit would have been useful in these circumstances, the reply from the CECA project manager was that none of the local on site foremen probably knew first aid anyway.

The Evaluation Team takes most serious exception to these conditions and to the attitude of the supervisory personnel in Rethy. The situation was discussed between the Evaluation Mission team leader and the ORT project manager (who accompanied the Evaluation Mission to Rethy). The ORT project manager stated that he had been unaware of the situation and was equally distressed by the work conditions on site.

The following day, a working session of ORT, CECA and ACEC/DVV was held and the Evaluation Mission attended as observers. On the recommendation of the Evaluation Mission, the ORT manager took immediate action to address this issue and informed the ACEC/DVV that they would not receive the next payment under their contract (30% of the total) which has now come due until all of the working condition issues listed above are resolved to ORT's satisfaction. Further, ORT requested ACEC/DVV to provide documentary evidence of paid up all risk liability insurance as a condition precedent to payment.

In view of the attitude of the supervisory personnel as indicated clearly above, the Mission:

RECOMMENDS THAT ORT AND USAID AFTER THE PACD MAINTAIN CLOSE SCRUTINY OF WORK CONDITIONS AT THE SUB-PROJECT SITE. IF WORK CONDITIONS ARE NOT CORRECTED WITHIN FOURTEEN DAYS, THE MISSION RECOMMENDS ISSUING A STOP WORK ORDER TO PREVENT POSSIBLE INJURY AND/OR DEATH TO LABORERS ON A U.S. GOVERNMENT FUNDED PROJECT.

THE MISSION FURTHER RECOMMENDS THAT ORT SUGGEST TO ACEC/DVV THAT IT ENSURE THAT WAGES PAID UNDER THE SUB-GRANT AGREEMENT ARE CONSISTENT WITH PREVAILING PRACTICES IN THE AREA FOR UNSKILLED LABOR.

7.4 The Distribution of Sub-project Benefits

The Evaluation Team was asked to examine the issue of how the benefits of the sub-project are distributed. The Project Proposal dated February, 1984 states that "the main beneficiaries will be the 25,000 inhabitants of the Zabu Groupement...Approximately 2,500 people will benefit directly from the electricity produced by the hydroelectric installation."

Since the inception of the Koda subproject, ORT has stressed the importance of equitable benefits to both the missionaries and the surrounding communities. In January, 1985, in a policy review with CECA, ORT stated:

"...it has been ORT's concern that the completed... system not only equitably benefit missionaries and the Mission facilities but also serve to improve the quality of life of surrounding communities and generate small scale rural enterprise...although (CECA) is considered the formal recipient of the grant, they also represented the surrounding communities, considered by ORT as equal beneficiaries."

On a superficial level, the sub-project appears to provide disproportionate benefits to American missionaries and their families since the following percentages can be calculated using the information provided in the April, 1985 NRECA report:

- o 55% of all power generated would be consumed by Rethy mission residences and commercial operations;
- o 10% by Rethy public facilities (the mission hospital, mission optical shop and mission administered but government financed public schools);
- o 01% by the nearby military camp; and
- o 34% by Kwandrumba (2% public, 22% commercial and 10% residential).

It should be noted, however, that among missionary residences are those for the two doctors (soon to be three) and nurses who work at the hospital. The home of the operator of the optical shop (the only source of eyeglasses in Haut Zaire) and of general support personnel also benefit. The private Rethy Academy for missionary children (grades 1-9) also benefits but these are, at least partly, the children of those providing health care and optical services

to the larger community. Although the CECA missionaries are very explicit that their primary purpose at Rethy is evangelization and their church and other religiously oriented activities will be electrified, it is clear that the majority of the power generated will contribute to development and welfare objectives. Further, purely religious activities such as the church will pay for the electricity at the same rate as other users in Rethy under the rate structure currently proposed (see 7.6 below).

Further, the services of the CECA project manager (unpaid) in advancing the technical and construction objectives of the project have been very valuable and the presence of a core of relatively more affluent people able to pay the full economic rate for electricity will be of central importance to the long term economic viability of the project (see 7.6 below). The mission station also benefits the surrounding community indirectly by serving as a market for some local produce, by providing improved seeds from mission grown crops to local farmers and in other ways. These are also important considerations when addressing the question of who is benefitting from the project and to what degree.

Finally, the Evaluation Team noted on the NRECA map of the transmission lines that they cross a Catholic mission station which is not indicated for electricity service. The Evaluation Mission visited the station and found a primary school with 365 pupils in eight separate thatch structures. Although the classrooms were dark and illumination would certainly improve the school's facilities, the Mission concluded that upgrading of the physical structures would be required before electricity could be safely used (i.e. doors and windows should be installed in the openings and repairs are needed to some of the mud and stick walls). On the next site visit, the ORT project manager might consider meeting the Catholic priest who is responsible for the school to learn if there are any plans for improving the primary school and to apprise him of the potential availability of electrification.

During the interview with the CECA project manager, the Evaluation Team was assured that electricity would be provided to anyone requesting it who was able to pay the standard rates and who used the electricity in a safe manner even if CECA disagreed with the practices or beliefs of the consumer (e.g. the Catholic church or a commercial establishment selling beer). On the other hand, based on comments made by the CECA project manager to the Mission team leader that he was glad NRECA had not recommended electric service to the Catholic mission station due to his own religious convictions, we are not convinced that CECA will make an unbiased effort to apprise all potential consumers (e.g. Catholics) of the availability of service. ORT and, later, USAID may need to monitor this aspect to ensure equitable availability and distribution.

7.5 The Proposed Management Structure of the Hydro Facility

Both the NRECA report of April, 1985 and the legal advisory opinion of a U.S. law firm obtained by ORT in March, 1987 strongly recommended that CECA establish a separate non-profit limited liability corporation to administer

the hydro facility. A separate entity would protect CECA from being legally liable for any accidents caused by electricity. In this way, CECA's other assets would be protected and a separate Board of Directors would govern the activities of the hydro facility. The new CECA entity could also be registered as a member of the ECZ.

NRECA recommended a nine voting member Board of Directors in which CECA would retain the positions of President, Treasurer and Secretary as well as an absolute majority of members. Kwandrumba would have one voting representative and areas outside the service area, but with an interest in the system, would have two non-voting members (one of which would be from Lokola).

CECA's legal representative has indicated that CECA, at present, prefers to retain direct control of the facility as a division of the current CECA organization even if this places all CECA's assets at risk. A draft set of regulations for operation of the facility are now under review.

It should be noted that the ORT-CECA sub-grant project agreement stipulates under Conditions Precedent (E.3) that "... an independent consultant be called in to help the concerned parties develop an equitable system of power distribution and user fee payments. The final design of such a system would then become binding upon all parties involved and will be considered an integral part of this contract..." This Condition should be brought to CECA's attention in writing with emphasis placed upon the requirement that the SYSTEM is to be developed by the CONCERNED PARTIES and that the final design RECOMMENDED BY AN INDEPENDENT CONSULTANT would then become binding on all parties.

This Condition Precedent limits the freedom of CECA to design the system and requires compliance with the recommendations of an independent consultant. In the event that ORT should determine that the sub-grant project agreement is not being adhered to, section F.9 of that agreement states that ORT "reserves the right to redirect project activities as it sees necessary."

In discussions with ORT/Kinshasa and USAID, it is clear that both favor substantial involvement by the Kwandrumba community in the design and management of the hydro facility. The NRECA report recommends Board membership for Kwandrumba in a separate entity. At present, there is no involvement of Kwandrumba in the facility other than as a minority of the eventual consumers of electricity. Consequently, the Evaluation Team:

RECOMMENDS THAT ORT WRITE AN OFFICIAL LETTER TO CECA COPIED TO USAID REITERATING THE CONDITION PRECEDENT (E.3) CITED ABOVE AND URGING A SUBSTANTIAL ROLE FOR KWANDRUMBA IN WHATEVER ORGANIZATIONAL FRAMEWORK IS EVENTUALLY AGREED UPON BY THE CONCERNED PARTIES FOR MANAGEMENT OF THE FACILITY.

7.6 Prospects for Sub-project Self-financing (User Fees)

The objective of the user fee system is to cover full operating costs, contributions to a depreciation fund and contributions to a development fund. The development fund serves as a fictive loan repayment activity (assuming a soft loan of 6%) in order to simulate a commercial venture which might, for example, have been initiated by an international financial institution. The objective is to demonstrate financial viability of this pilot scheme in order to assess the potential for replication of the project design.

The interpretation of what was referred to in the Project Paper as "amortization costs" has thus undergone significant changes from the time the sub-project was first approved. The Project Paper envisaged an amortization cost to be recovered which would equal 3% of the capital cost per year over a 35 year period. The project cost was taken to be the budgeted amount of \$1,417,000. Interest payments were not included in the original cost estimates since the sub-project was a grant and not a loan.

In the Cooperative Agreement between ORT and AID, the term "self-financing" was rephrased as "self-sustaining." This has been interpreted to mean that a sinking fund should also be established to cover future costs of major system replacements as well as system improvement and expansion.

The April, 1985 NRECA report did much to quantify the financial aspects of the sub-project. Energy and power projections were developed which enabled calculation of potential sales figures. These projections were based on interviews, written requests for electricity, records of existing electrical use, and estimates derived from this information. Operation, amortization and unit costs were projected based upon the following calculations:

- 1) Total monthly operating costs of \$1,455
- 2) System depreciation fund of 3% per year of \$1,417,000
- 3) Monthly principal and interest payments for a soft loan at 6% repayable over 50 years on a principal amount of \$1,417,000

The resulting recommendation was a general energy rate of 0.11 U.S. cents per KW hour. This was to be implemented by using meters for larger energy users and by establishing a demand limited service for small energy users with a fixed flat rate of \$4.51 per month.

By March, 1987 the interpretation of the "self-financing" purpose had taken more of a commercial frame of reference. The goal was described as being to demonstrate that if the sub-project were a truly commercial enterprise, it would be able to meet reasonable debt service requirements of international lenders. A more detailed financial study was completed by NRECA to determine the cost of service and appropriate rates based on the following assumptions:

- 1) Total monthly operating expenses averaging about \$1,000 in year one and gradually increasing to a \$2,260 average monthly by year ten.

- 2) Depreciation broken down into 5 year, 10 year, 35 year and 75 year categories for a total depreciation of \$30,376 per year on total initial capital costs of \$1,138,000.
- 3) Expenses and depreciation include costs of maintaining and operating the existing diesel generation equipment for backup.
- 4) Principal and interest payments on a simulated 35 year loan with a principal amount of \$1,250,000, interest rate of 6% and a three year grace period on principal and interest.

This study was developed on a computer spread sheet format to more easily determine the effect of changes in number of consumers, electrical usage, rate schedule changes, etc.

The computer model provided by NRECA to ORT shows a positive cash flow in all years of operation and a positive net margin in year ten and beyond with rate schedules starting at 0.11 U.S. cents per KW hour for single phase and 0.10 U.S. cents per KW hour for three phase service, increasing to 0.14 per KW hour for single and 0.13 per KW hour for three phase by year seven. In this model, the critical year for cash flow is year six, with end of year cash projected at a little under \$27,000.

EVALUATION OF THE ABOVE SCENARIOS - MAJOR POINTS

1. The interpretation of the "self-financing" requirements of this sub-project is much more comprehensive and also more burdensome now than that which was originally proposed. The present interpretation is likewise much more realistic in terms of generating financial support for future projects.
2. Based on the projected energy use and the commercial feasibility interpretation of the financial goals of the sub-project, the NRECA studies are consistent and basically valid. The major conclusion of the studies, as pertains to rates, is that to meet the demonstration goals, revenue from the project must average at least 0.12 U.S. cents per KW hour over the first seven years of operation.
3. A close review of the financial analysis shows that in the first five years, the key to showing commercial feasibility rests almost completely on the expatriate mission activities at Rethy. In the second five year period, Zairian commercial activities become a significant factor. Zairian residential use will remain commercially insignificant well after the initial ten year period analyzed.
4. A significant limitation of the rate analysis studies is that they do not address the effect that rates have on energy use. Obviously, higher rates tend to discourage energy use, while lower rates have the opposite effect. Unfortunately, for this pilot project, the relationship between rates, energy use and consequent revenue have not yet been well established.

5. A second significant limitation of the studies is that only the revenues received through the management of the project are considered. Economic benefits to community businesses through increased productivity, higher sales, etc. are not considered. The result is that economic justification for this project is judged from a very narrow perspective.

6. The present computer study format cannot accommodate fixed flat-rate schedules or block-rate schedules. For example, a rate of 0.12 U.S. cents per KW hour for the first 500 KW hours and 0.10 U.S. cents per KW hour thereafter cannot be entered with the present computer program.

7. The rate studies are shown in U.S. dollar amounts and basically assume a constant dollar value. Social, political and financial considerations resulting from converting these constant value assumptions into local currency approved rates will significantly affect the final evaluation of "self-financing" capability.

During the Evaluation Team's visit to Rethy, one entire evening was devoted to a discussion of user fee rate options and the assumptions underlying the options. A central concern which emerged from the meeting is the ability of the flat rate consumers in Kwandruma to pay for the wiring, the connection fee and the monthly charge. The CECA manager stated that he believed most Kwandruma consumers would be able to afford the initial costs and monthly charges at the rates proposed in the NRECA study. (Costs were estimated as connection fee Z1,100, wiring from Z2,000 to Z5,000 and a monthly charge of about Z200 at the exchange rate of Z110 to the dollar).

One means to ease the burden on the low-income consumer would be for the hydro facility to loan the funds for the wiring to the consumer and recover it through higher monthly fees spread over several years. The CECA manager also noted that those buying wire from the CECA store from present stocks would pay a lower rate (Z2,000) than those buying wire later since the present stock has been subsidized by CECA. Even so, it was pointed out that a primary school teacher earns about Z1,200 a month (not much more than an unskilled laborer) so that the connection fee alone represents about a month's wages. The CECA manager noted that local people earn other income from the sale of surplus agricultural produce and could sell a 50kg sack of beans, for example, to pay for the connection fee.

Another alternative considered at length at the meeting was a two tiered system in which more affluent consumers would subsidize the low income consumers. At present, the missionary community is paying 60 U.S. cents per KW hour for diesel generated electricity. The hydro facility will bring the cost down to 11 cents per KW hour under the proposed NRECA rate structure. The Evaluation Mission electrical engineer noted that the small number of low income consumers in question could be assisted with an increase of as little as two cents per KW hour added to the metered rate for missionaries and the more affluent commercial users in Kwandruma. The CECA project manager indicated his preference for maintaining a single tier system at about the NRECA recommended rate in order to confine the underlying rate structure assumptions to economic rather than social considerations so as to demonstrate economic viability.

It is the view of the Evaluation Team that economic viability may be demonstrated while also taking into greater consideration the economic realities of the average Kwandruma potential flat-rate electricity consumer. The Evaluation Team engineer was asked to compute the variances in the user fees for different categories of consumers based upon the NRECA consumption estimates to determine how much subsidy would be required from (a) large scale residential users only and (b) large scale residential users plus large and small scale commercial users in order to keep monthly flat-rate consumers costs down to a realistic level.

If a monthly flat-rate charge of Z150 is used for the 65 flat-rate connections planned for year one at an exchange rate of Z110 to the dollar, the KW per hour charge falls to 5.4 U.S. cents. To make up the loss in revenue (the difference between 11 and 5.4 cents) by charging the difference to large residential consumers (in effect missionaries at Rethy) alone, the

rate for them would rise from 11 to 12.6 cents. If the subsidy to flat-rate consumers were spread to include large and small commercial users, the rate would fall to under 12 cents. If the number of flat rate consumers in year one were doubled to 130, the subsidy would still only raise the cost to other non-public consumers about one cent per KW hour. Given AID's interest in the social good as well as the economic viability of the hydro scheme, the Evaluation Mission believes these options should be vigorously pursued.

It is beyond the scope of work of the Evaluation Team to recommend either a rate structure or a rate to charge for electricity consumption, however, the Team does:

RECOMMEND THAT ORT REQUEST NRECA OR USE THE NRECA LOTUS 123 COMPUTER MODEL TO REVIEW SINGLE AND DOUBLE TIER RATE OPTIONS WITH A VIEW TO ENSURING THE AFFORDABILITY OF THE SYSTEM FOR LOW INCOME USERS WHILE RETAINING AN OVERALL RATE STRUCTURE WHICH WILL ENSURE REALIZATION OF THE GOAL OF A SELF-FINANCING SYSTEM.

Specifically, NRECA might review rate structure options to better answer such questions as what will be the net effect financially if:

- all electrical rates are 11, 12, 13 cents, etc. per KW hour
- a small residential rate is fixed at Z100, Z150, Z200, etc. per month;
- the present Zaire exchange rate changes to 130, 150, 200 to the dollar
- low flat residential rates result in the number of consumers in that rate schedule increasing by 50%, 75%, 100%, etc.
- the number of commercial consumers increases or decreases by various percentages.
- multiple block-rates are used? (e.g. 12 cents per KW hour up to 500 KW and ten cents per KW hour thereafter.

With respect to the connection fee, it is recognized that people who make a sacrifice for something they want will value the service more so than if it is free or nearly so. The Mission agrees that a connection fee of about \$10 (Z1,100) is acceptable for flat-rate consumers if (a) the monthly rate is then kept affordable and (b) the initial rate is not merely a temporary inducement to encourage initial capital outlay for the service. Flat-rate users should be guaranteed that their initial monthly rate will not be increased for at least twelve months and that, thereafter, it will not be increased more than a fixed percentage per month with an annual cap announced annually by the Board of Directors.

For comparison, ORT may also wish to obtain a copy of the rate schedule used by the CECA mission in Nyankunde which currently collects user fees from

the functioning hydro scheme located there and from similar schemes elsewhere in Africa. Finally, to assure that financial data is properly recorded and is recorded in a manner which will permit later analysis of the scheme's self-financing viability:

IT IS RECOMMENDED THAT THE DRAFT CHART OF ACCOUNTS PREPARED BY CECA FOR RECORDING INCOME AND EXPENDITURES BE REVIEWED BY A CHARTERED ACCOUNTANT FOR COMPLETENESS, LOGIC AND INTERNAL CONSISTENCY. IT IS NOTED THAT TECHNOSERVE RECENTLY PREPARED A CHART OF ACCOUNTS FOR DPP UNDER AN ORT CONSULTANCY WHICH WOULD INDICATE THAT LOCAL EXPERTISE IS AVAILABLE IN KINSHASA TO UNDERTAKE SUCH A REVIEW.

Regarding the assumptions underlying the debate on the sustainable level of user fees for flat rate consumers, ORT should carefully review with NRECA the recent World Bank study¹ of Zaire's energy sector. Of particular importance are the Bank's observations that:

- o the relative costs of charcoal and electricity may not induce interfuel substitution. Whereas a recent SNEL household expenditure survey estimated that a typical family consumes about 2400 (May 1986) worth of charcoal, traditional charcoal cooking has not been replaced by electricity even where power has been provided free of charge.
- o non-financial constraints are also affecting the French-government assisted COGELEX scheme (4,500 corrections), as evidenced by "a lack of consumer interest."

The Bank proposed that SNEL undertake a Household Energy Survey with Bank assistance as soon as possible. Perhaps ORT could contact the Bank to see if the Rathy - Kwandruma area could be included in their study.

7.7 Review of Sub-project Outputs and Conclusions

According to the Project Proposal, the three conditions expected at the end of the sub-project were:

- o construction of a 300 KW hydropower installation;
- o a team of locally trained electricians in place to monitor and maintain the system;
- o the establishment of a user fee system to finance the costs of operation, maintenance and amortization of the system.

Several estimated dates for the completion of this sub-project have come and gone. As of the time of this Final Evaluation, none of the sub-project outputs have been achieved. The physical construction of the facility was estimated to be 65% completed on April 30, 1987. There is no team of locally trained electricians in place and CECA has failed to prepare a training plan

¹ Zaire: Issues and Options in the Energy Sector, (The World Bank: May 1988), Report No. 5837-ZR.

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for the achievement of this objective. Worse, the American CECA project manager who was sent to the U.S. for ten weeks training is now leaving the project area for 12 months without as yet having identified a replacement or trained anyone to take over any significant proportion of his duties. A user fee system is now under discussion and the system is being developed with the assistance of NRECA. Each of these points is discussed at greater length above and in Annexes 2 and 3. They are summarized here in order to present some conclusions and general recommendations with respect to this sub-project, as follows:

First, it is clear in hindsight that the primary subproject objective (construction of the hydro facility) was not realistic in light of the PACD. By early June, 1986 the ORT Engineer, Dan Goder, was already predicting in his trip report that the work would not be completed before the end of 1987. The lag in achieving the primary sub-project output directly contributed to the delay in achieving the other two expected outputs. The sub-project funding level does seem to have been appropriate and there appears to be adequate funding to complete the primary objective. The PACD certainly appeared reasonable at the outset and construction would most likely have been completed before the PACD had DVV not gone bankrupt. Clearly, this could not have been planned for. Nonetheless, the numerous difficulties in executing this sub-project do provide lessons for the future, lessons which are even more important in light of the pilot nature of the sub-project and AID's particular interest in the feasibility of using a professional construction firm or consortium to build a mini hydroelectric facility.

Second, compared to the other two sub-projects (ECZORT and DPP), the PVO executing the Koda hydro sub-project appears to have benefitted least from its association with ORT in terms of institutional development and training. This is partly because CECA at Rethy already has significant management capability. It is also because the nature of the sub-project activity was mostly construction and a separate contractor was used for the construction work, thus limiting the PVO to a supervisory role.

In a meeting held in Rethy on April 30, 1987, ORT imposed five conditions precedent to be fulfilled before payment of the next 30% of funds to the construction consortium would be permitted. One of these was the submission of a detailed plan of action which would enumerate precisely what steps remain to be taken to achieve the primary sub-project purpose. In theory, the contractor's plan will demonstrate that the construction of the facility will be completed before the PACD of September 30, 1987. In reality, it is the judgment of the Mission's civil and electrical engineers that electricity is unlikely to be generated by the facility before the PACD. In view of this, two recommendations are being made as follows:

IT IS RECOMMENDED THAT THE AID/ORT PROJECT AGREEMENT BE EXTENDED TO DECEMBER 31, 1987 AND THAT THE ORT PROJECT MANAGER BE RETAINED FOR THESE THREE ADDITIONAL MONTHS TO ENSURE COMPLETION OF THE HYDRO FACILITY, FULL CONTRACT COMPLIANCE BY ACEC, DEVELOPMENT AND IMPLEMENTATION OF A TRAINING PLAN BY CECA AND THE ARTICULATION OF A MANAGEMENT STRUCTURE AND USER FEE SYSTEM WHICH TAKE FULL ACCOUNT OF THE INTERESTS OF KWANDRUMA AND OTHER ZAIRIAN VILLAGES NEAR RETHY

IT IS FURTHER RECOMMENDED THAT A FINAL TECHNICAL EVALUATION BE CONDUCTED AFTER ELECTRICITY HAS BEGUN TO FLOW TO ENSURE THAT A SAFE AND COMPLETE SYSTEM HAS BEEN INSTALLED. AN ELECTRICAL ENGINEER SHOULD CONDUCT THE FINAL REVIEW. EITHER REDSO, USAID/KINSHASA OR CONSULTANT ENGINEERS COULD BE USED FOR THIS PURPOSE.

By early 1988, USAID should have a fairly complete dossier on the difficulties and obstacles which confronted the design, construction and institutionalization of the Koda Falls hydro facility. USAID has also assisted a PVO in Karewa over an eleven year period to build a hydro facility for its mission and has experience from another built at Tshikaji using U.S. Hospitals and Schools Abroad funds. In addition, there are other mini hydro schemes in Zaire (e.g. Bunia) and nearby countries. At this point, the Team:

RECOMMENDS THAT USAID UNDERTAKE AS PLANNED A MINI HYDRO SCHEME RESEARCH AND EVALUATION STUDY TO OBTAIN COMPARATIVE COST ESTIMATES, COMPARATIVE DATA ON THE DISTRIBUTION OF BENEFITS, COMPARATIVE ASSESSMENTS OF USER FEES AND LONG TERM FINANCIAL VIABILITY DATA. IN THE SCOPE OF WORK FOR THE STUDY AID SHOULD SPECIFY ITS GOALS FOR HYDRO FACILITIES WITH EMPHASIS ON HOW IT VIEWS THE RELATIVE IMPORTANCE OF AIDING ZAIRIANS DIRECTLY, AIDING ZAIRIANS INDIRECTLY THROUGH SUPPORT OF MISSION RUN PUBLIC FACILITIES (HOSPITALS) AND ASSISTING MISSIONARIES DIRECTLY WITH THEIR ELECTRIC NEEDS.

Annex 2

TRAINING

1. D.P.P. SUB-PROJECT
2. ECZORT SUB-PROJECT
 - 2.1 Training Strategy
 - 2.2 Content and Methodological Approach
3. KODA SUB-PROJECT
 - 3.1 Training at the International level
 - 3.2 Training at the local level
4. OTHER TRAINING
5. TRAINING IMPACT

TRAINING

While Project 660-0097 was basically designed as a commodity procurement project, each sub-project included a training component as part of the project's effort toward institution building. Given differences in the nature of each sub-project, the training approach varied from one sub-project to the other.

1. DPP SUB-PROJECT

As the result of an institutional diagnosis carried out by the ORT Project, D.P.P. - the development branch of the Diocese of Idiofa involved in a number of development activities - was found struggling with deep managerial problems. It soon became apparent that simply helping that organization build bridges was insufficient; the overall managerial capacity of the organization needed to be strengthened. The diagnosis had found deficiencies in both general and financial management. Management training along with a complete revision of the accounting system were recommended as important actions to undertake immediately.

The approach used for management training for D.P.P. was that of organization development in the sense that the course was designed to address the organization as a whole; all its managers were to attend. Course materials were developed so as to reflect the D.P.P. situation as much as possible. For example, role plays and case studies were often taken from participants' experience with D.P.P.

The course was divided in five training modules and taught intermittently in five weeks:

- Module 1 : Effective team work in an organization
- Module 2 : Choosing management objectives, leadership, effective délagation, problem solving, decision making
- Module 3 : Project Planning and Evaluation, Report writing
- Module 4 : Interpersonal communication, Conflict Management, Elaborating micro-projects
- Module 5 : Logical Framework, Evaluation of personnel performance.

The sequence of the modules does not look very logical; for example, the evaluation of personnel performance and the logical framework have little in common; job description and elaborating micro-projects focus on different things.

Other than this problem of organizing the course material in a logical way, the approach as well as the content of the course were relevant and appropriate: first, a needs analysis had been carried out and served as a basis for developing course materials. Needs analysis before designing a course is a step that is too often overlooked in many training programs. That the project took this critical step should be acknowledged as a positive achievement. Second, holding the training session for all the managers of an organization is more likely to bring about some change within the institution than would the traditional approach of sending one or two managers of an institution to attend a training session where there are nearly as many institutions of origin as there are participants.

The approach used by the project has its own shortcomings, especially when all the participants do not have a homogeneous educational background. The more educated participants tend to overwhelm their less educated colleagues. As a result, the latter take less advantage of the course. Regarding the D.P.P. training sessions where the participant's education background ranged from four years of secondary school to three to five years of College, the trainers often faced the problem.

Experiential learning methodology as used by the trainers and the content of the course itself were enthusiastically appreciated by the participants. As one of them commented: "we certainly have not suddenly become highly qualified managers as a result of these five training modules on management; but one thing is certain: we are now aware of many mistakes we were making in the past, we want to correct them".

How successful have they been in correcting those mistakes could not be verified by the team. Active observation in the field is needed to determine what impact the training has actually had on the organization. Some of the questions that should be addressed are discussed in the section which deals with the impact of the project training effort.

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As previously mentioned, another OPT or convention with D.P.P. consisted in revising the accounting system, this has been accomplished; the year recommends a training session on financial management so as to make the most concerned personnel of D.P.P. familiar with the new system.

2. ECZOPT Sub-Project

2.1.1. Training Strategy

Under ECZOPT, training took place at three levels: national, regional and local. The national level training focused on improving managerial skills to MCZ's and zone administrators, the top management level of the national health care. The regional level training was of two types: the first was technical and sought to strengthen the participants' skills in planning, personnel management, public relations, etc. The second type of training was general and was intended for health zone administrators. In the local level, there were no courses, but a series of training sessions for health development committees, health zone administrators and health workers, and training of community health workers.

This strategy of decentralized training at both regional and local levels is basically a sound practice especially for cost effectiveness reasons. In view of the number of health care facilities, it would have been impossible, for example, to hold a national course for all health zone administrators and members. In addition to cost-effectiveness, reasons should be given as a cultural reason as well, particularly with regard to the role of development committees and community health workers. They are familiar with the particular situation of their region and may not accept an upward view; the only language spoken in all the regions of the country, and well, community health workers coming from the same zone is that they can be shared their experiences in the development process from the health zone and region to other health zones and regions.

Though decentralization appears to be justified for community health workers for members of development committees at the state level, the mechanics, there was also good reason for training sessions at the national level for the MCZ's and the zone administrators. As will be discussed in a subsequent section, course materials were developed on the basis of a nationwide needs assessment. Moreover, this particular training was launched as a pilot effort that tested the materials that were developed.

2.2 Content and Methodological Approach

The first of the training courses, the management course, was one of the other courses. Before ECZOPT, the health zone administrators, health workers and administrative staff to community health workers, as well as health workers, the course materials and materials were developed.

A training needs assessment in a sample of seven rural health zones and 14 health centers preceded the training. Deficiencies were detected in several areas, such as:

- lack of careful planning;
- conflicts of job attributions;
- insufficient control and evaluation;
- unclear accounting systems;
- unreliable procedures of equipment and drugs procurement.

As a result of this needs assessment, four training modules were developed focusing on the management of human resources, finances, drugs, supplies and equipment. The modules were tested on 45 MCZ's and administrators coming from 40 health zones.

This approach has advantages as well as disadvantages. One important advantage - as it was confirmed by some of the participants interviewed during field trips - is the possibility of sharing experiences and information. In effect, health zones in Zaire represent a variety of management experiences. Where the reference hospital is church sponsored, management style and habits will differ from a state hospital. Even among the church sponsored hospitals, noticeable variations are found between the Catholics and Protestants. Still within catholic and protestant groups, there are differences.

One important disadvantage of this approach is that the person who has attended the training session faces an uncomfortable situation when he/she returns to her organization. She may hold quite new views concerning the way the organization should work, or as a result of the training he/she may suggest changes, but the superior, the peers or the subordinates will often reject his/her ideas. She may be looked at as the person with "those unrealistic ideas".

However, the most important criticism that can be levelled against this particular training seminar is of a different sort: the number of participants - 45 - was excessive, especially when experiential learning methodology is used.

The number of facilitators is even more impressive: 27 among whom only two or three are known to have experience as trainers. It is doubtful whether experiential learning was truly used in this case. Among the facilitators, expatriate consultants were also hired, which raises doubt about the sub-project concern about cost effectiveness. Qualified Zairians were available, there were no acceptable reasons for hiring 27 facilitators among whom some were expatriate consultants. The four modules that had been developed were later integrated with management materials from modules developed by the Extended Vaccination Program (PEV). New modules were thus added: planning, primary health care concept and project evaluation. Materials for this last module are yet to be developed.

Both the initial modules and the integrated ones were developed in a joint effort with other donor agencies and with other health projects (SANRU, PEV). This should be pointed out as a positive achievement in that ECZORT did not go its own way but did strive to collaborate with other interested institutions.

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The integrated modules were tested on another group of 23 MCZ's and administrators in a seven week long seminar.

A follow-up evaluation was undertaken among the first group of MCZ's and administrators who had taken the four management modules. The evaluation sought to assess the extent to which knowledge and skills acquired through the seminar were put into practice in the field and eventually to detect parts of modules which were unclear, thus requiring further revisions. The four modules have indeed been revised as a result of this evaluation.

The quality of the materials is, in the team's opinion, of high standard. However, the other three modules that were integrated with the PEV materials need to be evaluated and revised before they are reproduced in large quantities. This second follow-up evaluation will obviously be carried out among the 23 participants of the integrated modules.

Despite criticisms as previously made, the team considers the management modules as a training program that was designed following the most rigorous methodological procedures. Needs were assessed prior to developing materials. The latter were then tested on a sample of the client group. A follow-up evaluation was later undertaken for the purpose of revising those materials before they can be published. Rare are the training programs that systematically follow this methodology which is professionally the required procedure.

There is little that can be said about the other training courses, primarily because ECZORT provided no technical inputs; instead, its contribution was limited to providing funds and administrative and logistical support. This was the weakest part of the ECZORT training component; funds were provided with little concern about the quality of the training. There was no technical contribution to the development of the training materials or quality control of the training actually provided.

The quality of the course materials on vehicle repairs and maintenance, have not been assessed since they are purely technical. The course on drug management is a shorter version of the larger module on the subject developed for MCZs and zone administrators, the quality of which is excellent, as previously mentioned.

With regard to the Training of Trainers (TOT) of community health workers, ECZORT used materials developed by the World Health Organization. While the quality of this material is of very high standard, it needs readaptation to the Zairean context. One important step that will have to be made in this direction is a follow up evaluation among former trainers; then results of a such evaluation will be used to revise the WHO materials.

Much more substantial work needs to be done concerning the training of development committee members. No standard curriculum has been developed. ECZORT provided funds upon request from health zones. The content and the methodology were entirely made up by the MCZ or by the zone administrator. When requested by the evaluation to show the materials that had been used for the training of the development committee members, a zone administrator - who was the trainer for the course - was unable to show even the outline of the content.

There is need to produce a standard reference material that can be used throughout the country. To achieve this, a national workshop is recommended in which the MCZ and administrators who have held training sessions of the members of development committees should participate. CEPAS, which is known to have high quality expertise in this field, should also be invited to attend the workshop. The purpose of the workshop would be to produce guidelines for the development of training materials for development committee members.

TABLE 2-1

TRAINING QUANTITATIVE OBJECTIVES AND ACHIEVEMENT.

CATEGORY of Personnel trained	Target Number	Number actually trained as of March 31, 87	Percent of target
1. Pharmacists	30	27	123
2. Maintenance Technicians	60	44	73
3. Trainers of CHW Trainers	45	55	122
4. Development Coordinators	23	26	113
5. Nurses trained as trainers of development committee members	200	533	276
6. Community Health Workers	500	596	119
7. Development Committee members	350	?	?
8. MCZ and HZ administrators	?	68	?

Much of the above discussion indicates that, in general, courses were financed but little was done to control quality. However, as far as quantity is concerned, it should be stressed that ECZORT surpassed its objectives, as table 2-1 shows.

The highest achievement (276 % of the target member) was recorded in the category of nurses trained as trainers of development committee. The lowest achievement (73 %) was recorded in the category of maintenance technicians. That many more people were trained than initially planned is largely due to the fact that ECZORT had little or no control over the actual number of people who attended those sessions, this was mainly left up to the MCZ, ECZORT simply provided funds to run the sessions.

3.3. KODA SUB-PROJECT.

Training for the KODA sub-project took place both at the international and the local levels.

3.1. Training at the International Level.

The sub-project manager, Mr. Brown took a ten-week training course in applied management, administration, operation and maintenance of a small hydroelectric system. The National Rural Electric Cooperative Association (NRECA) had the responsibility of organizing and conducting the course. The latter was both theoretical and practical: a week was spent in Washington for orientation and formal instruction in general management, principles of organization and financial planning. The rest of the time was devoted to field experience focusing on engineering/construction, operations/maintenance and administration.

Training program as designed by NRECA was basically sound. The KODA manager himself expressed satisfaction over the content and the methodology used.

However, there are a number of reservations about the choice of the participant who attended the seminar. Mr. BROWN is a missionary who will be away for at least a year, beginning July 1987. As a missionary, the possibility that he is sent to another mission station by his church group cannot be overlooked. However, the 660-097 manager states that he did not know that the KODA manager would be away from the plant for a year, during the period when the hydroelectric plant would begin to operate.

When asked about the percentage of the skills, he has been able to transfer so far to the Zairians working with him, Mr. Brown admitted that very little has been done. He estimates that less than 15 % of the skills he had gained in the U.S. have been transferred to the Zairians, basically because of the lack of equipment such as the transformers which have not yet arrived on site. Underground wiring and some basic accounting are about the only skills transferred so far.

While the absence of the required equipment is an important limiting factor, it believes that even when the equipment arrives, little still will be transferred to the existing Zairian personnel: they are basically unskilled workers who have received some training on the job and have thus developed some skills on bookkeeping, underground wiring, etc. None of them is up to the level of absorbing the managerial, administrative or engineering "know-how" that had justified the \$14,000 training investment that had been made on Mr. BROWN.

For the purpose of institution building, a Zaïrian citizen should have been trained either in place of or along with Mr. BROWN. On the other hand, that it might have been difficult to recruit a Zaïrois with a technical capacity and "moral" qualifications as required by the CECA community. The question then is whether AID should support PVOs that discriminate against qualified personnel on the basis of religious preferences.

It is recommended that AID should take the necessary action to urge CECA to hire a qualified Zaïrois as the expatriate manager of KODA or as his counterpart. If a counterpart is recruited, Mr. Brown should also be urged to train him.

3.2. Training at the Local Level.

At the local level, the sub-project recruited 20 youngsters in basic electricity of whom about five wound up being trained. The idea was to recruit as many people as possible, so that with the expected high rate of dropout, three to five trained technicians could be found on site to ensure the maintenance of the facility, house wiring and other basic operations. Initially, this training was conducted by Mr. Brown himself; it has now been taken over by ACEC, the contracting company. Both lectures and practical work have been used as the main training methodology.

Mr. Brown has also initiated a campaign to inform the public about the safe use of electricity. This is done through images and simple warning messages such as : Do not climb on the electric pole. This is an important initiative that should be encouraged.

The idea of training a number of local young people who can later use the skills on their own is valuable. They can also be hired by KODA. However, it is difficult to assess the extent to which objectives have been achieved. There was no training plan and no written training objectives. The KODA sub-project had received a budget of Z. 105,000 for training, but the manager was not sure how to use it. It is not certain that these funds were used efficiently. The manager himself admitted that about 50% of the budget was used for a trip to an hydroelectric facility in Butwe to observe its operation, but little was learned, all that could be observed was how to start and stop a turbine.

4. Other Training

As part of its contribution to the strengthening of PVO's, the 660-0097 financed one course for the managers of the Central and Regional Technical Groups of ECZ.

The course focused on regional planning and project evaluation. Again, ORT intervention was limited to providing funds, it had no control over the content, the methodology, the choice of trainers or the quality of the training provided.

No meetings were held with the trainers or the trainees; however, examining the course materials that were produced, it can be observed that a wide range of subjects was covered in one week. The depth and the quality of the training are in doubt. It is questionable whether the participants understood and retained much from the course. Under the best circumstances, a planning tool such as PERT is taught in at least 3 days; according to the course schedule, it was covered in less than 2 hours.

The project also helped coordinate and manage funds that were received from the Canadian International Development Association (CIDA) to carry out management training for a number of PVO's in Zaire. The project's role was purely administrative. However, reports indicate this training was highly appreciated by the participants, requests have been made by other PVO's to attend the same seminar.

5. Training Impact

The training sessions for all three sub-projects mostly took place in 1986. It is premature then to assess their impact only a year after they have been held. Changes are not easily introduced in organizations as the result of a training. What complicates an impact assessment further is the fact that training has several intangible effects: even for those that can be measured and observed, it is difficult to determine to what extent they actually result from training. Even with the best research design, it is not easy to sort out training effects.

During its short visits in the field, the team could only rely on opinion statements by former participants and sometimes by their supervisors, subordinates or peers.

At D.P.P., former participants find the five management training sessions most beneficial. There seems to be more open communication and more concern about systematic planning, time management, etc.

D.P.P. is still struggling with structural problems, these will be solved and settled before it can be determined whether the managerial concepts that were learned are being used and whether they are doing any good to the organization.

Once the organizational problems of DPP are settled, it will be essential to undertake an active observation type of evaluation to determine the impact, not only of the training sessions, but that of the entire ORT institution building effort. Such an evaluation is particularly important if future involvement with local PVOs is envisaged. The ORT-DPP venture is a pilot effort in reinforcing a church managed institution through training. To ensure better success in future ventures, it is imperative to evaluate this pilot effort. Some of the questions that this type of evaluation should answer are:

- What concepts among those learned, have actually been put into practice, what difficulties, if any were encountered?
- What areas of the organization have changed as a consequence of the training?
- How is that change defined in both qualitative and quantitative terms? As much as possible the change should be shown in comparison with the conclusions of the needs analysis performed in 1985.
- If no change has taken place, what were some of the most important hindering factors?

With regard to the health zones, the follow-up evaluation carried out in March 1987 showed that the concepts that had been learned were not fully put into practice. There was little time to verify in details which among the learned concepts were or were not put in practice. The members of that follow-up evaluation team admit that changes are taking place in several health zones, even though not all the concepts that were learned were put into practice. During field visits, the present evaluation team could observe some of these changes; as most MCZ's who were visited said, effort is seriously being made to set up a sound accounting system both at the Central Bureau of the health zone and in the health centers. Although there is still room for improvement, drugs and equipment are now managed more efficiently. "Fiches de stock" are widely used; supervision is more and more viewed as an effort to help the health center nurses to improve their performance, rather than an opportunity for the MCZ to inspect and to punish the nurse.

At the community level, the most visible impact of training is that development committee members are beginning to support and to promote health activities. Where development committees are most active, head nurses can count on them as they encourage women to vaccinate the children and to attend prenatal and under five clinics.

Concerning the KODA sub-project, the most visible training impacts is that the trainees are now able to perform underground wiring and to pose electric poles. More about what they can really do and the effectiveness of their work will be seen only after the KODA plant becomes operational.

In conclusion, substantial effort was made by the project to ensure that training take place as part of its contribution to institution building. While most quantitative objectives have been achieved, there was inadequate quality control. However, materials for management training of high quality were produced and are ready to be produced in large quantities for use by other institutions.

Materials for other courses (see table 2.2) need to be developed or revised and then reproduced in large quantities. In so doing, a set of high quality training materials will be available for use by other institutions. This will add more to ORT's effort to strengthen institutions through training.

The overall impact of the training program is hard to assess now, given that only a year has elapsed since most courses were taught; however a number of behavioral changes are beginning to occur.

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MAJOR RECOMMENDATIONS

THE TEAM RECOMMENDS THE PRODUCTION OF STANDARD TRAINING MATERIALS FOR SOME OF THE MAJOR COURSES THAT WERE FINANCED. TO ACHIEVE THIS, THE FOLLOWING ACTIONS ARE SUGGESTED CONCERNING.

- (1) MANAGEMENT COURSE FOR MCZ'S
A FOLLOW-UP EVALUATION OF THE MANAGEMENT MODULES DEALING PARTICULARLY WITH PLANNING AND PRIMARY HEALTH CARE, AND THE DEVELOPMENT OF THE MODULE ON PROJECT EVALUATION.
- (2) DPP MANAGEMENT COURSE
A FOLLOW-UP EVALUATION AND THE REVISION OF THE MATERIALS.
- (3) GRT COURSE
USING THE FINAL DOCUMENT OF THE COURSE THE DEVELOPMENT OF A TRAINING MANUAL INCLUDING A TEACHER'S GUIDE.
- (4) MEMBERS OF DEVELOPMENT COMMITTEES
A FOLLOW-UP EVALUATION OF COURSES DESIGNED AND TAUGHT BY MCZ'S; A NATIONAL WORKSHOP TO SUGGEST MAJOR GUIDELINES OF A TRAINING MANUAL ON TRAINING COMMUNITY HEALTH WORKERS AND DEVELOPMENT COMMITTEE MEMBERS.

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A SUMMARY OF RECOMMENDATIONS
ON MAJOR TRAINING INTERVENTIONS

SUB-PROJECT	COURSE	COMMENTS
D.P.P.	General Management	<p>Course materials available. A follow-up evaluation of previous course is needed before these materials are reproduced for further use.</p> <p><u>Audience</u> : Middle and top level managers of development projects</p>
ECEORT	<p>* Management of - Human Resources - Finances - Drugs - Material Resources (Supplies and Equipment)</p> <p>* Modules on Planning and Primary Health Care</p> <p>* Modules on Evaluation</p>	<p>Course materials available and ready for massive reproduction; recommended for use by other interested institutions (Ministry of Health, FONAMES, etc.)</p> <p><u>Audience</u>: Health Zones Managers (MCZ, Administrators and Hospital Directors)</p> <p>Need to be evaluated before reproduction.</p> <p>Need to be developed.</p>

A SUMMARY OF RECOMMENDATIONS
ON MAJOR TRAINING INTERVENTIONS

SUB-PROJECT E	COURSE	COMMENTS E
	* Management of - Drugs	Course materials available, recommended for massive reproduction. <u>Audience:</u> Health Zone Pharmacists
	* Regional Planning and Project Evaluation	Course materials available, can be used as reference manual only. Needs further elaboration for use as a training module. <u>Audience:</u> Middle and top level managers of development projects.
	* Training of Trainers for Community Health Workers	WHO materials available, need to be adapted to the Zairian context. <u>Audience:</u> Nurses at the RHZ level.
	* Training of Members of Development Committee	Materials to be developed based on experiences in the field and on CEPAS experience. <u>Audience:</u> Members of Development Committees in villages.

A SUMMARY OF RECOMMENDATIONS
ON MAJOR TRAINING INTERVENTIONS

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SUB-PROJECT	COURSE	COMMENTS
KODA	* Training of Mechanics	Materials need to be assembled and produced as one standard module.
	* Management Training/Engineering/Administration of Hydroelectric Plant	Materials available in English. Should be made available at the Plant's library.
	* Basics in electricity	Materials need to be developed.

PRM:Dr. Ngay/nl
Document: 7539c
May 12, 1987

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ANNEX 3

ENGINEERING REPORT

Project Title: Project Management for PVO Economic Support Project

Project Number: 660-0097

Submitted by:

William Baron, Civil Engineer

Ross Turner, Electrical Engineer

May 12, 1987

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A-1: Engineering Report on DPP Sub-project
Farm to Market Road and Bridge Development

A-2 Civil Engineering: CECA Koda Falls Hydroelectric Sub-Project

Part B: Electrical Engineering Report:
Koda Falls Hydroelectric Sub-project
Solar Electric Installations (ECZORT)

Part C: Rehabilitation of Health Clinics, ECZORT sub-project

Annex 3
CIVIL ENGINEERING REPORT

Part A-1

Sub. Project: Agriculture/Marketing Farm-to-Market Access
(Rural Roads and Bridges)

- I. Executive Summary
 - II. Introduction
 - A. Location of sub-project
 - B. Purpose
 - C. Objective
 - D. Sub-project design and construction responsibilities
 - E. Site selections
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 - VI. Recommendations
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- Exhibits (Photos of 6 bridges sites)

I. Executive Summary

The objective of sub-project: Agriculture/Marketing ... Farm-to-market Access is to help create a secondary network of east-west road linkage so that movement of goods and services can be achieved with greater ease in the sub-region of Kwilu from the interior previously inaccessible or hard to reach areas to major market and administrative centers. To implement the physical construction portion of this sub-project the DPP (the development arm of the PVO, the Diocese of Idiofa) was charged with its implementation.

The sub-project paper calls for some 750 kms of feeder roads to be rehabilitated whereas the co-operative agreement stated 500 kms of rehabilitations and improved roads. In actuality some 700 kms were eventually affected. To accomplish this upgrading or rehabilitation, USAID/Kinshasa choose to carry out the following work; i.e. a) replacing aging ferries with bridges, and b) improvement of the road network by the installation of metal culverts at selected sites and undertake side drainage systems to the roads. Thus, some 9 bridge sites were selected. At this time 6 ACPOW Bridges and 1 Bailey bridge have been constructed and are now in place whereas two other sites destined to receive ACROW bridging are still under construction with on-going work in preparing abutments to set the bridges on. Some 164 culverts are already installed from the 180 called for.

The bridges observed (6) are properly constructed, properly aligned, and correctly placed on their abutment foundations. All work appears to be satisfactory in the respect. Approaches to be bridges are another story. With the type of soil at the bridges sites, these access or approaches to all the bridges are in need of attention. The sandy/clay type soil that has been used to construct these approaches will need to be replaced by more suitable soil such as "laterite" so that it can be properly shaped and compacted, or another solution found using the existing soil; such as using a soil cement stabilization.

A discrepancy exists in the testing of concrete samples taken from material used in the construction of the abutments for the bridges. Nearly all samples had failed the compressive tests as performed by LNTP. This discrepancy cannot be resolved by visual inspection but needs to be further evaluated by an independ laboratory examining the results of the present tests and making other type testing. It has been recommended that an independ testing laboratory be given a contract to undertake this work.

In sum, it may be stated that from the inception of this project through the various phases, i.e. project design, procurement of materials, equipment and other commodities, technical assistance provided in the studies for the design of structure, delivery-assembly-launching of bridge, construction of abutments and foundations, culvert installation and various and sundry othe construction activities at and around the bridge sites, that all personnel involved performed each and every task well and therefore deserve a "well done".

II. Introduction

A. Location of sub-project

The sub-project is located in the Province of Bandundu with primary concern to the sub-region of Kwilu therein. The principle routes traversing this area National Route 1 (running generally in east-west direction), and National Route 19 and its extension National Route 20 to the North of National Route 1. These latter two routes general parallel the Kasai river. Within this sub-region there are also innumerable tributaries of the Kwilu and the Kasai rivers. Between the major artery (National Route 1) and the two routes mentioned above which also generally run east-west, there is a distance of about 125 to 150 kilometers where no other "all-weather" road(s) connect east to west. Although there are a number of regional priority classified roads running parallel (north-south) to the many tributaries of the two major river systems, and which to the many tributaries of the two major river systems, and which effectively link the three east-west National Routes mentioned above, there still remains many highly populated and productive areas within hundred of square kilometers of area with no effective road net which could connect said areas with any national or regional roads.

B. Purpose

They are three main purposes concerning this sub-project but only two directly concern the construction element; there are:

- o To create a freer movement of goods and service into and out of the sub-project area for the areas economic progress.
- o To improve and hopefully create a cheaper internal transport system for the sub-area so that it will have greater accessibility to social services; i.e. health, education etc.

C. Objective

The prime objective of this sub-project is to help create a secondary network of east-west road linkages which will permit the movement of goods and services to and from these interior isolated pockets to major markets and administrative centers within the sub-region of Kwilu. To achieve this objective, a Private Voluntary Organization (PVO); i.e. the Diocese of Idiofa was selected to carry out the implementation of the sub-project through its development arm, the Development Progress Populaire (DPP).

As originally envisaged the following project outputs were made which adequately describe its description:

- o A minimum of eight ACROW bridges to be installed. (This numer has now been increased to nine.)

- o Between 150 to 200 culverts to be installed. (Thus far, 164 have been placed.)
- o Training of 8 road maintenance teams from DPP and 12 teams from collectivities within the sub-project area in proper road maintenance techniques and especially focussing on the design and preparation of drainage systems (See Section IV Field Visits).
- o Management training for six to eight DPP senior and mid-level staff in the areas of personnel administration, financial control, commodity procurement, distribution and control etc will be provided by ORT as part of an institution building exercise.
- o In total, over 725 kilometers of road will be rehabilitated as a result of this sub-project with some 20 cantonniers trained and 6 to 8 DPP management staff upgraded through skills training.

D. Sub-project Design and Construction Responsibilities

According to information called from ORT's files the sub-project was to be implemented as follows with responsibilities defined:

- o ORT, the overall Project Manager for USAID/Kinshasa was to provide DPP up to six months of short term technical assistance (TA) which was to be used to design the bridge abutments and train DPP senior and mid level staff in management skills, and DPP and collectivity cantonniers in road maintenance techniques.
(ORT employed the local firm of Compagnie Africaine des Ingénieurs - Conseils (CADIC) for this TA)
- o DPP was to provide one full time project director for the duration of construction under this sub-project. This project director was to be responsible for overall project direction. (This was found to be the case)
- o Office des Routes (OR) was to provide (at a no charge basis) two technical teams to assist DPP in the assembly and installation (launching) of the ACROW bridges. (This was found to be the case)

In commodity purchases ... ORT was to provide through dollar funding eight (later increased to nine) galvanized steel ACROW bridge sets of varying length together with enough panels and transoms, etc to construct two launching noses. ORT also was to purchase enough ARMOO galvanized sheet metal to construct culverts with diameters ranging from 30 cm to 240 cm. The DPP using counterpart funds was to purchase galvanized steel sheets also for the fabrication of culverts. Between ORT and DPP enough sheet steel was purchased to fabricate 100 culverts as called for.

Counterpart funds were also used for the purchase of vehicles, equipments and construction materials, etc.

The following list of equipment was purchased for the sub-project and placed at the disposal of DPP.

- o 1 front-end loader (Case)
- o 2 dump trucks (7 tons)
- o 1 cargo truck (7 tons)
- o 1 Toyota Landcruiser
- o 1 Landrover
- o 1 motorcycle
- o 10 bicycles
- o 2 concrete mixers

The Office des Routes (OR) provided on loan to DPP one small front-end loader (Ford). (Presently deadlined)

Eight complete bridge sets were transported to the various bridge sites by a commercial transport company from Kinshasa, whereas, OR transported one complete bridge set to the site at Ekudi.

E. Site Selections

Site selections for bridging were based on a consensus between USAID/Kinshasa, ORT and DPP based on the most trafficked locations where aging ferries were in service and should be replaced with bridging.

	<u>Bridge Name</u>	<u>River Name</u>	<u>Type</u>	<u>Span</u>
o	Mingangi	Lubwe	DSR	140 ft
o	Itunda	Loandji	DRS	120 ft
o	Munga	Loandji	DRS	130 ft
o	Ekubi	Kamtsa	DRS	130 ft
o	Obala	Fantsa	DRS	130 ft
o	Inferme/Loano	Loano	SSR	70 ft
o	Mibul	Lukwa	DSR	130 ft
o	Kimpanga	Dule	DSR	130 ft
o*	Mingungi	Lukual	TS	130 ft

* Bailey Bridge (Same Features as ACROW, except deck is wood whereas ACROW uses steel.)

F. The ACROW Bridge

The ACROW panel bridge is an improved modern version of the World War II Bailey Bridge. In sum, in appearance and design these two bridges are identical (see photos at Exhibits). Like the Bailey, all ACROW panel bridges are formed from a number of panels pinned together end to end to form a truss, with trusses linked together to form the main load bearing structure. The manner in which the panels are grouped together determines the load the structure will carry. The roadway is carried between two main load carrying girders, the vehicle load being transmitted to the side girders through deck units by means of cross girders known as transoms (I beams). The stiffeners of the compression chord is maintained by diagonal members known as rakers and in multiple girders and bracing frames.

A through bridge is one in which the roadway is carried between two side girders. A bridge is simply supported when it is a single span resting on bearings on abutments at each end.

Each side girder is composed of from one to four trusses joined together where there is more than one truss by bracing frames. Trusses may be one panel high, known as single storey, or two panels high, known as double storey, with the upper panel bolted to the lower storey. Where each side girder has only one truss, the bridge is known as single truss; with two trusses in each, double truss, etc. When referring to the a particular bridge it is normal to omit the words truss and storey, so that a double single storey bridge with cord reinforcement is known as Double Single Reinforced (DSR). The vehicle load is transferred through the decking to cross girders known as transoms, and from transoms to the side girders.

Thus, for purposes of this sub-project there are only two types of ACROW bridges used; i.e. DSR and DDR. The Bailey bridge is a TS.

III. Review of Subject

A. Background Correspondence

During the course of this evaluation a continuous review was made of all correspondence available at the ORT office. It included, inter alia; office correspondence; reports of site visits made by the ORT civil engineer; commodities procurement concerning bridging sets (both ACROW and Bailey); correspondence with USAID/Kinshasa, CECA and DPP; the Mid-Term Evaluation of 097; Co-Operative Agreement; program performance reports, etc.

B. Development Progress Populaire (DPP)

The DPP is the development arm of the PVO recipient of this sub-project, the Diocese of Idiofa . As such, it was entrusted to execute the road and bridge rehabilitation work called for. DPP has considerable experience in the area of construction and therefore is called upon by other Catholic

institutions in the Bandundu region to undertake a variety of construction projects. Its headquarters is in Idiofa. Among its various divisions it is actually the "infrastructure division" that undertakes civil engineering construction activities such as roads and bridges as well as other types of construction. Although it has had no previous experience with the erection of a ACROW or Bailey Panel Bridge, it has gained considerable expertise in this direction by having been assisted by Office des Routes (OR), the latter being well experienced with these types of bridges both in assembly techniques, erection and launching.

C. Plans and Specifications

Considerable time was spent reviewing all plans and specifications for the nine bridges. For the purpose of providing design and specification services (technical assistance), ORT employed a local firm of Compagnie Africaine Des Ingénieurs-Conseils (CADIC). Several meetings were held with CADIC engineers to discuss various aspects of bridge and abutment designs, all to the satisfaction of various questions the evaluator had.

It was determined that the studies, plans and design features for each of the bridges were done in an acceptable professional engineering manner. It was noted however, that the recommendation surfaced in the Mid-term Report by the engineering evaluator was not incorporated in any design change to the drawings - hence during construction it was not carried out. This feature concerns the "gabions" (a steel wire cage filled with irregular stones ranging in size from 6 to 18 inches in diameter). The cages after they are filled are cemented over on the top and sides for further strength. These "gabions" are placed, according to plans, at the base of the constructed concrete abutments, its purpose being to keep river currents from washing away soil and undermining the abutments. Since it is common practice only to place these steel cages snug and adjacent to the abutment, it was believed to be in better engineering practice to tie them directly to abutments by using reinforcing steel rods. Gabions are in common usage overseas whereas the American practice is to use rip-rap (huge stones cemented in place on a given slope from the base of the abutment extending a given distance downward into the river). This civil engineer evaluator is in full agreement with the mid-term evaluator. However, as pointed out, since it is not a common practice here in Zaire, and with the experience derived by locals from the building of other similar type abutments of using this method of "gabion" placement, it is the opinion of this evaluator that no harm will come to the abutments.

Concerning the testing of concrete in the abutments as to its quality and strength, this only became an issue when raised by the USAID/R engineer on April 15, 1987. At that time, he made a review of ORT's records and tabulated the concrete compressive strength of the samples taken from the abutments at various bridge sites. It was noted that all samples tested below the minimum recommended strength, with the exception of samples taken from Loano abutments which indicated acceptance.

In a discussion held with the CADIC engineer concerning this subject - he appeared to be puzzled as to the findings since his firm had never been apprised of this situation - especially at this late date when abutments have been constructed and bridges built and in place. Thus, this evaluator is in agreement with him that perhaps results provided by the Laboratoire Nationale de Travaux Publique (LNTTP) may be erroneous as the laboratory may have erred in its calculations regarding collecting, curing, transporting etc. of the samples.

Comment: It is the opinion of this evaluator after having discussed this issue with CADIC, and after having thoroughly visually examined each and every abutment, that there were no flaws in construction observed such as cracking, chipping, spauling, evidence of movement, slippage etc., that these abutments are built according to plans and specifications and will do the job. From a visual perspective the abutments appear to be first class. (See Section VI for recommendation concerning this issue).

IV. FIELD VISITS - Findings

A. GENERAL

Site visits and visual inspection were made of the following bridge locations: Mingandji, Itunda, Munga, Ekubi, Obala and Inferme/Loano. ACROW bridges were erected and in place in four of the above locations, except at Munga and Inferme/Loano. At Munga work was in progress for the making of gabions and placing them at the abutment locations. At Inferme/Loano work was in progress on the two abutments which are still under construction.

B. ACROW BRIDGES

Concerning the ACROW Bridges; each and every bridge was thorough inspected. All were correctly aligned and properly placed on their respective bearings inside a base plate affixed atop the abutments. Each bridge part from the panel through-to-the-metal clip that holds the panel in place was inspected. Each and every part is in place, and properly fitted. No visible damage was observed to any bridge part.

C. EMBANKMENTS

At several bridge sites the embankments at the end sides of the bridges still need to be properly sloped, compacted and grassed to prevent erosion. There are some locations where DPP personnel indicated these slopes would be held in place by affixing gabions to prevent erosion and then grassed over.

D. ITUNDA BRIDGE

The one bridge that of Itunda where it was reported as being too low to the high water mark was found to be built according to plan. At high water mark when observed on this field trip the distance from the bottom of the bridge to the level of the river measured more than one meter. DPP personnel stated that there is no commerce that passes under this bridge since the

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natives have placed up and downstream from the bridge sunken logs that are used to form fish traps for local fishing. As far as any heavy logs or trees carried downstream during a heavy rain which might endanger the bridge itself is highly doubtful.

E. APPROACHES

The one big item that needs attention is the approaches to the bridges (this applies to all bridges), in that the loose sandy material will not hold up over time from continuous erosion that is constantly taking place especially during the rainy season. Practically at all bridge entrances there were evidences that poor soil (sandy/clay) was poorly compacted and erosion is sitting in.

(See Section VI for recommendation)

F. CONCPETE SAMPLES

While at the Munga bridge site where work is on-going for the construction of the abutments - it was noted that three concrete samples taken from concrete used in the abutments were ready for transport to Idiofa and three others were still emersed in water. As explained by DPP personnel at site - the procedure for the samples (a block 20 cm x 20 cm x 20 cm) is that after the sample is taken it rests in water for 5 days then it is taken to Idiofa for further transport to the laboratory in Kinshasa for compression testing. It was further stated that at times it took up to 3 to 4 weeks from the time the sample was first taken until it passes through the laboratory.

G. CULVERTS

In general more than a dozen steel culverts were examined during the site visits. All appeared to be correctly placed and properly put together from what could be seen at either end of the culvert. All had water passing through them. The only fault that could be found here - was that they all are "too short". From those observed, all needed to be extended at least one meter on both ends to be more efficient and allow for eventual road widening when they are re-built. The DPP personnel accompanying the evaluator agreed on this observation and comment. Concrete head and wing walls have yet to be constructed on the majority of the culverts seen.

At the Munga site there is a huge marsh area that is more like a small pond some 200-300 meters from the western shore. At this site there are 2 steel culverts in place - both are "two short" and unable to carry the water. Because of this, the existing track is eroding away. Unless this situation is immediately corrected the "track" or present roadway will be cut-in-two. (See Section VI for recommendation)

V. CONCLUSIONS

The obvious focus here is the performance of DPP, the quality of workmanship, the bridges per se, the cooperation given to DPP by OR, and whether the purpose and objective of this sub-project were achieved. Thus, it is the opinion of the evaluator for the civil engineering aspect of this sub-project that indeed all of the items listed above were achieved.

In essence, the new ACROW bridges are properly aligned, undamaged and properly constructed. DPP's performance in preparing the abutments and other earth preparation work for the bridges is noteworthy when seen in the light of having to accomplish these tasks under difficult conditions in remote and rural areas within the sub-region of Kwilu, Likewise, OR should be complemented on the assistance given to DPP in erecting and launching the bridges and for the training it gave to DPP.

As for the approaches to the bridges, since the soil is not conducive for making properly compacted road beds and surfaces, more suitable material will have to be found or a solution of using "cement soil" will have to be used.

Certainly the network of roads that surround these bridges will have to be improved along with the construction of proper drainage ditches this coming dry season so that traffic can start to move with greater ease and safety.

Culverts should be extended where they are determined to be too short, and faced with properly constructed concrete head and wing walls at both ends of the pipe. This will be the job of DPP which is fully capable of accomplishing this task.

The plans and specifications prepared by CADIC were determined to be well made and thoroughly responsive for the structures upon which the ACROW and Bailey bridges rest. As for the testing of the concrete samples, this issue is addressed in the recommendations section of this report.

Lastly, USAID/K and ORT's participation in the execution of this sub-project need some mentioning. From a review of ORT's correspondence and records concerning the civil engineering aspect of this sub-project, both USAID/K and ORT performed their respective tasks well and should be congratulated for their ingenuity, perseverance and dedication to getting the job done within the time frame allotted. The only improvement here would have been for both the USAID/K and ORT civil engineers to have made more site visits during the various phases of construction for each bridge.

VI. RECOMMENDATIONS

Recommend that the following actions be taken:

- o That USAID/K through ORT enter into a contract with an independent laboratory such as the University of Kinshasa at Kimwenza for the following purposes:
 - a) To examine the findings of the concrete compression tests done by LNTP taken from concrete samples obtained from concrete used for abutments at various bridge sites for the 097 sub-project. To examine such data, method of calculations etc, then render its opinion on the validity of same and what the consequences will be if the results as originally determined by LNTP are found to be correct, i.e. that nearly all of the samples failed to pass the minimum compressive strength tests.

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- b) To make site visits and examine all abutments with a Schmid hammer (scléromètre) to estimate the average concrete strength of each abutment and render its findings and opinion on the relative strength of each.
 - c) To make recommendations as to what course of action to follow if the concrete in the abutments is found to be defective.
- o That at the Munga site - western shore near the marsh area - replace the existing 2 steel culverts with a small concrete culvert (or small bridge) perhaps 3M high, 3M long and a roadway with 4M (exact measurements to be determined by DPP) to effectively carry the large amount of water that collects in the area due to the passage of small streams and natural springs that run off in a direction that traverses the road. Construction should start this dry season as the existing "tract" road is about to be cut.
 - o As soon as the dry season commences remove all of the loose sandy material some 500 meters on each side of all bridge location and replace it with a more suitable material such as laterite. If no laterite is to be found or unavailable, then a special mix of on site material stabilized with the appropriate amount of cement (soil cement stabilization) should be incorporated into the access approaches. This work is suitable for DPP under the guidance of OR assistance since all approaches should be properly shaped and compacted. As mentioned elsewhere in this evaluation report, OR stated a Belgian financed project will address this type of soil stabilization on roads throughout the region; however, time is of the essence on these approaches and work should be started by DPP without delay.
 - o That with regularity, examine all bridges at least once every month for the first year, then every 3 months thereafter - remove all debris collected around abutments, embankments, gabions at the sides and below the bridge, and in between panels and transoms. Make sure all pins, clips, nuts and bolts are in place and secure. Examine all panels and side curbs on bridge decking for any damage. Report any damage immediately to OR for advise and/or corrective action.
 - o That white stripes be painted with reflecting paint on each end piece - both sides of bridge - on all bridges.
 - o That warning signs be posted at least some 300 M from bridges (both sides) that bridge is ahead, and to go slow and cross bridge with caution since bridge is for 1 way traffic.

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- o That no parking, or repairs to any vehicle are to be made on the bridge.

VII FOCUS ON EVALUATION

A. EFFECTIVENESS

Although the sub-project paper stated that 750 kms of feeder roads were to be rehabilitated the actual accomplishment was 700 kms where these roads during the course of the sub-project were improved by DPP through grading, installation of culverts and appropriate side drainage ditches constructed. Improvements were also accomplished with the replacing of aging ferries with bridges at nine selected locations (7 are complete as of this evaluation and 2 are still undergoing construction). All feeder roads are being maintained by either "Operateur Economique" or "Collectivite". This was accomplished prior to the start up of bridge installation and it can be assumed will continue for the foreseeable future - thus there is some assurance of sustainability in this respect. The measure of effectiveness will be determined when the agricultural sector in those areas will use the improved network of rural roads that are served by bridges (replacing aged ferries) when the season approaches to move their produce to market centers with greater reliability and ease of transport; not to mention the social aspects of such improved routes.

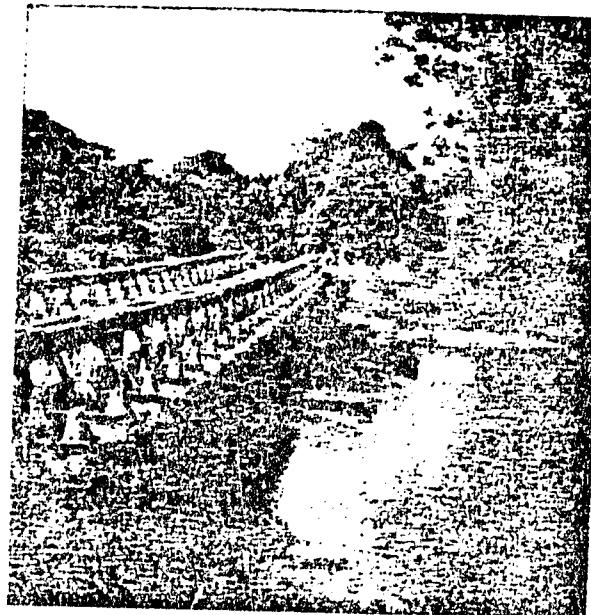
B. SIGNIFICANCE

The significance of this sub-project which concerns the civil engineering aspect is that it has added a new dimension to the knowledge of DPP in road and culvert construction, and how modern type bridging is put in places with the least amount of time.

097 SUB-PROJECT
REHABILITATION OF RURAL ROADS
(BRIDGES)



1



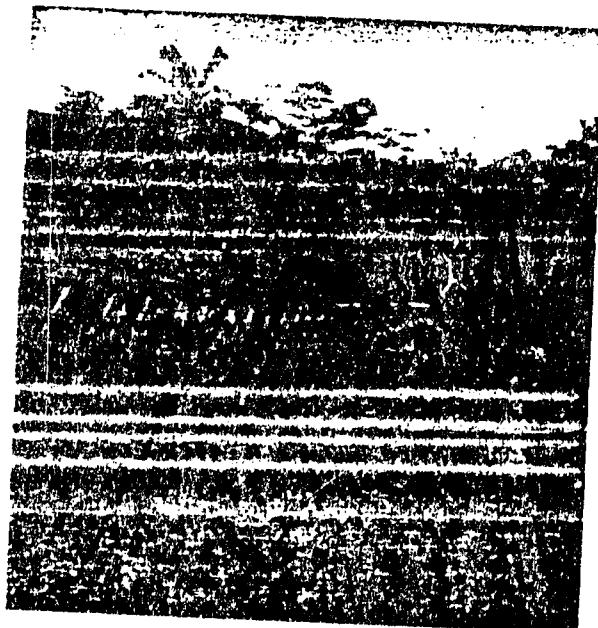
2

VIEW OF SE ABUTMENT

BRIDGE SITE: MINGANDJI

VIEW OF NW ABUTMENT

TYPE: DSR



3



4

VIEW OF SE ABUTMENT

BRIDGE SITE: ITUNDA

VIEW OF NW ABUTMENT

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097 SUB-PROJECT
REHABILITATION OF RURAL ROADS
(BRIDGES)



VIEW OF WEST ABUTMENT

BRIDGE SITE: MUNGA

VIEW OF EAST ABUTMENT

UNDER CONSTRUCTION



VIEW OF EAST ABUTMENT

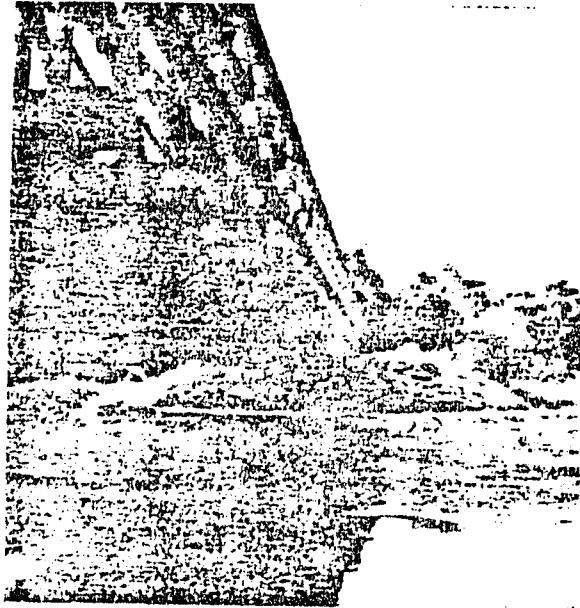
BRIDGE SITE: EKUBI

VIEW OF WEST ABUTMENT

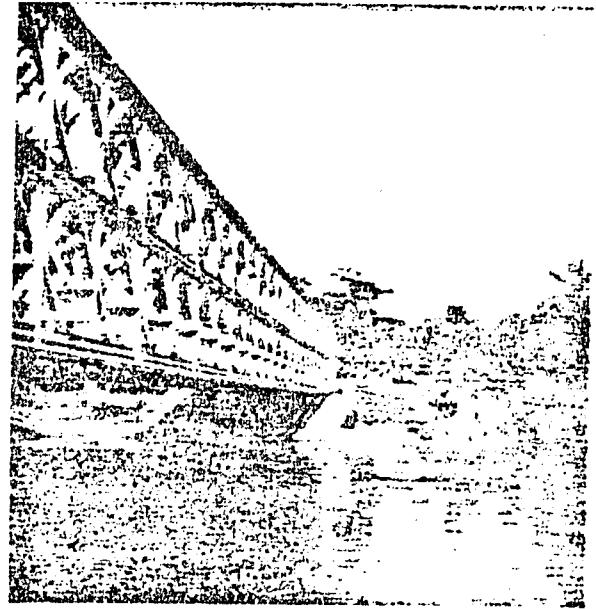
TYPE: DSR

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097 SUB-PROJECT
REHABILITATION OF RURAL ROADS
(BRIDGES)



VIEW OF EAST ABUTMENT



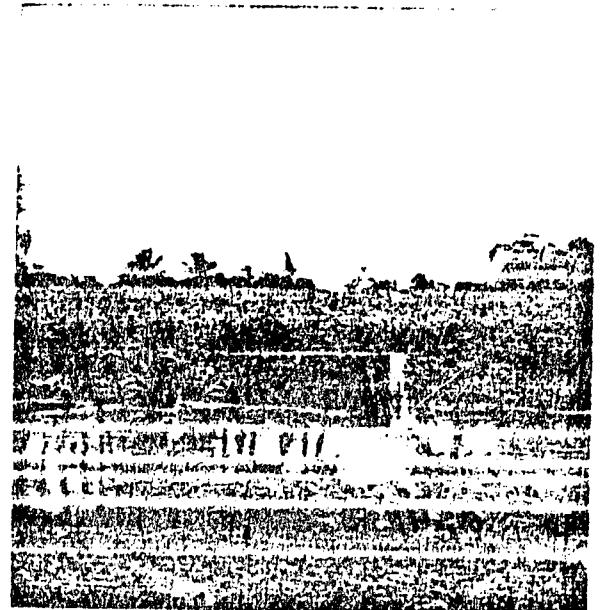
VIEW OF WEST ABUTMENT

BRIDGE SITE: ODALA

TYPE: DDR



VIEW OF NORTH ABUTMENT



VIEW OF SOUTH ABUTMENT

BRIDGE SITE: INFERME/LOANO

UNDER CONSTRUCTION

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PART A-2

CIVIL ENGINEERING REPORT

SUB-PROJECT : KODA MINI HYDROELECTRIC

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EXHIBIT 2 VIEWS OF HYDPO PLANT CONSTRUCTION

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I. EXECUTIVE SUMMARY

The Koda mini-hydroelectric sub-project was selected by USAID/K as a "pilot" project for bringing together a Private Voluntary Organization (PVO) and professional design and construction firms for the purpose of constructing a facility at a given location. To this end, USAID/K has achieved this objective. Thus, the PVO CECA was selected by USAID/K to implement its project at the Rethy Mission. A contract was later signed between CECA and a consortium (ACEC-BETEC-D.V.V.) for the physical construction of the facilities. ORT acted under contract from USAID/K to manage the whole of the sub-project by initially providing the administrative details in bring about this contractual arrangement. Procurement of commodities and equipment in accordance with AID guidelines and procurement regulation was also another function of ORT along with having provided civil engineering expertise to the project, although this expertise ended in January 1987 with the expiration of the civil engineer's contract with ORT.

Through a review of project documents, plans and specifications, discussions and meetings with various concerned parties, a site visit, and an analysis of various technical aspects of the on-going construction process; various findings were determined, conclusions drawn, and recommendations made. In sum, from the work done to date, and from what had been seen of the constructed facilities, all appear to have been constructed according to the approved plans accomplished with quality materials and workmanship. However, there are two exceptions to this statement; i.e. a) a change was made in the design and construction for the base of the dam upon which it rests on the bedrock foundation, and, b) a minor design change concerning the location of the future powerhouse was made placing it 3 meters closer to the face of the existing rock cliff. Both of these changes are judged to be in keeping with sound and acceptable good engineering practice.

The project as of April 30, 1987 was judged to be 60% complete for its construction phase. The remaining 40% will depend on whether the resolution of plaguing problems concerning D.V.V. takes place so that the work can continue without interruption at a normal pace. If this comes about, it is conceivable that the remaining portion of construction will be completed before October 30, 1987.

II. INTRODUCTION

A. DESCRIPTION OF SUB-PROJECT

The Koda mini-hydroelectric sub-project consists of a 300 KW hydro-electric facility on the Koda River falls near the Rethy Mission of CECA (Communauté Evangélique du Centre de l'Afrique), north of the town of Bunia, near lake Mobutu Sese Seko. The project also provides for the installation of some 11 kilometers of a 12 KV high tension line from the hydro-electric plant to the Rethy Mission and the nearby village of Kwandruma where a distribution line will supply 400/231 volts to consumers of this service.

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Simply stated, the sub-project consists of the following main elements :

- * Construction of a dam to pond the waters of the Koda River.
- * Construction of a penstock (pipeline) to carry the water from the pond behind the dam to the powerhouse.
- * Construction of a powerhouse to harness the waters from the Koda River by feeding it into a turbine, which will cause the electric generator to function producing high voltage electric current that will be fed to transformers, and thence to distribution and transmission lines.
- * Installation of the turbine, generator, transformers, transmission electric line and electrical distribution lines.

B. PURPOSE

The purpose of this sub-project is two-fold ; i.e. :

- * To provide an adequate supply of electric power to meet present domestic, industrial, commercial and health needs, and to encourage growth in the commercial and industrial sectors of Rethy, Kwandrama and neighboring villages.
- * To test the economic and technical feasibility of the selected mode of implementation through a Private Volunteer Organization (PVO) contracting out to professional design and construction firms for the actual construction of the facility.

C. OBJECTIVE

As for the purpose of this sub-project; likewise, the objective is two-fold ; i.e. :

- * To test the efficiency and cost-effectiveness of employing a professional firm(s) to carry out the technical work (design and construction) in lieu of relying on a PVO's self-help efforts.
- * To test whether a rural community hydro-electric facility can be self-financing.

D. PROJECT DESIGN AND CONSTRUCTION RESPONSIBILITIES

Implementation of the design and construction responsibilities for this sub-project envisioned that the design for the facility would be accomplished by a professional architectural firm. Likewise, construction would be carried out by an experienced private construction firm cooperatively with the PVO (CECA Mission). Thus, the general division of construction responsibilities was to be as follows : a) the construction firm would supply the skilled personnel for the civil and electro-mechanical engineering work. This was to include periodic on-site inspection of civil works, and procurement of

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materials, supplies and equipment from Kinshasa; b) the PVO (CECA Mission) was to supply unskilled labor from the local area ; c) the PVO (CECA Mission) was to assist ORT in the preparation of procurement orders ; and d) ORT was to monitor the sub-project implementation of construction (construction management) with its direct hire civil engineer cooperatively with a technician from the PVO (CECA Mission).

E. SITE SELECTION

This sub-project was originally part of a larger USAID/K strategy for promoting rural electrification on a national scale, since Zaïre has an immense underdeveloped potential for rural electrification. A study made by NRECA in 1982 revealed that GOZ's commitment to developing the necessary institutional structure was insufficient to effectively administer, implement and manage a national program. This condition influenced USAID's decision to postpone indefinitely a national rural electrification scheme. Searching for an alternative, USAID/K found that there were numerous PVOs in Zaïre that were interested in external financing for rural hydro-electric schemes of their own.

Because of the urgency of obtaining AID/W funding approval for the "097 USAID/K Project" of which the hydro-electric sub-project was a part thereof, USAID/K made a decision to undertake a "pilot" project with a PVO that came closest to its criteria for the selection of one that could effectively carry out such work. Based on this premise, USAID accepted CECA's formal proposal of its hydro-electric scheme since it met the criteria and submitted evidence that it had previous experience with the construction of rural hydro-electric projects. Thus, the site selection for this sub-project was fixed at the Koda River near CECA's Rethy Mission in Haut-Zaïre. It should be noted that CECA's Rethy Mission has obtained rights of water and land for this sub-project from local interested authorities.

The actual site of the sub-project is located some 10 Km south of the Rethy Mission for the construction of the dam and hydro-electric generating plant. The generating plant is to be located some 260 meters down the slope of a steep escarpment below the proposed dam. The Koda River that produces the KODA River Falls breaks out of a swamp and undergrowth and thence cascades at the location of the hydro facility into a forested ravine on its way to Lake Mobutu Sese Seko.

III. REVIEW OF SUB - PROJECT

A. BACKGROUND CORRESPONDENCE

A review was made of all available correspondence and documents available in the ORT Office. A part of this documentation was that originating from USAID/K, various elements of the GOZ, contractors, PVOs etc. Perhaps the most significant correspondence reviewed (as pertaining to civil engineering) was : a) the mid-term Evaluation of 097, annex A thereto which included, inter alia; an engineering review of Koda Mini Hydro Project (Project 660-0097)

dated 29 May, 1985 ; b) the Rural Mini-Hydro-electrification Project Proposal; c) The NRECA (National Rural Electric Cooperative Association) report ; the Cooperative Agreement for 097 between USAID/K and ORT dated september 30, 1983; and d) the USAID program performance reports.

It should be noted that the Koda Hydro-electric proposal was first submitted to USAID in June 1981. In June 1983, it was revised and updated by USAID/K for submission to AID/Washington as an OPG. The project proposal was then submitted to the American ORT Federation (ORT) as a sub-proposal under its PVO

Economic Support Project (660-0097) in December 1983. In turn, ORT received the GOZ/Department of the Plan's approval in January 1984 for the Koda sub-project. Based on the GOZ's approval, USAID/K subsequently approved the sub-project on January 5, 1984.

The interim evaluation of 097, Annex A gives the following information : "This study and contract is based on meetings with representatives from OPG, CECA, and assigned local people and a review of available data (drawings, construction documents)." It should be noted that the engineer evaluator (from U.S.S.R.) of the mid-term report did not visit the construction site at CECA's Pechy Mission. He did however converse with Mr. Paul Brown (CECA's Project manager/ Technician) on construction and technical issues pertinent to implementation of the hydro-electric project while the latter gentleman was in Kinshasa. Various site conditions were all known to the evaluator at that time. It was during this visit that the engineer evaluator wrote a detailed memorandum to Mr. Brown outlining his recommended quality assurance tests for the Koda hydro work. The advice given for the quality assurance tests is both sound and fully concurred with.

The Rural Mini-Hydro-Electrification Project proposal stated that the following preparatory activities had been completed :

- preliminary feasibility study by USAID engineer, private consulting engineer, and USAID economist;
- aerial photographs;
- line survey;
- rights of land and water secured;
- GOZ Department of Energy approval;
- access road construction;
- guard house built;
- utility building;
- local community organized."

B. SELECTION OF DESIGN AND CONSTRUCTION FIRMS

From what can be derived from the records, it appears that ORT assigned the PVO sub-project recipient CECA Ltd and wrote individual letters calling for "Invitations to Bid" (ITB) to 9 contractors that were deemed capable of carrying out the work at the remote site of Pechy. This was done in April 1984. The ITB called for design, construction and installation of a

hydro-electric system. Accordingly, three bids were received with price quotations from only three of the nine contacted by letter from ORT. The three bids that were received were as follow :

* AUXELTRA BETON	2,500,000 Z (for design only)
* SOTRAF	1,562,000 Z (for design only)
* BETEC-D.V.V.-ACEC	37,100,262 Z (for design and construction).

The 3 bids were reviewed by USAID/K which recommended that AUXELTRA-BETON and SOTRAF be disqualified as unresponsive since they submitted quotation only for the design and not construction as called for in the IFB. Thus, it was recommended that the firm of BETEC-D.V.V.-ACEC be awarded the contract based on the following evaluation as quoted from an internal USAID/K memorandum of June 8, 1984.

- a) Bid is fully responsive and in compliance with the requirements and invitation for bids ;
- b) Firms are professionally qualified and have had experience in the design and construction of small hydro installation and facilities;
- c) Cost estimate (Z. 37,100,262) is below the USAID/ORT cost estimate for KODA of Z. 42,000,000.*

USAID/K and ORT subsequently accepted this recommendation and invited the selected contractor (BETEC-D.V.V.-ACEC) to accompany a USAID/K-ORT team to Rethy to discuss the proposed working relationship between the CECA Mission and the contractor. This visit took place during June 8 to 12, 1984. The outcome of this meeting produced a working relationship between ORT- the CECA - and the contractor. Further, this meeting caused ORT to revise the original project proposal (Coop-Agreement) to reflect newly defined division of responsibilities and corresponding budget revision.

The Consortium of BETEC-D.V.V.-ACEC was to provide the following services if a contract was signed between the interested parties ; i.e CECA and the Consortium :

BETEC	- Design of civil works
D.V.V.	- Construction of civil works, and installations of electrical equipment
ACEC	- Design of electrical equipment

Subsequently, a contract was signed between the client CECA and the contractor (BETEC-D.V.V.-ACEC) on October 1, 1984.

C. PLANS AND SPECIFICATIONS.

Plans and specifications were reviewed and discussed with ORT, USAID/K Engineer, and Consortium engineering personnel, as well as, the D.V.V. superintendent of works on site and CECA's project manager/technician. The engineering evaluator is in full agreement with REDSO/WA engineer's reviews and comments made during the mid-term evaluation concerning said plans and

specifications with the following exception; otherwise, the plans are in sufficient detail for the construction of the facility :

He was concerned about the thickness of the penstock wall (steel pipe thickness) which he thought to be on 3 mm. However, review of drawings and visual inspection of the steel pipe, on site, it proved to be as specified, i.e. 6 mm in thickness throughout length of pipe except at the elbows where thickness has been increased to 8 mm

He recommended putting less money in the starway and more thought and time into the permanently installed materials handling system. If he had had an on-site visit, he perhaps would have changed his mind due to the acute steepness of the slope which the workers have to descend and climb the stairs numerous times during the work day. The plans are correct in this respect.

The main deficiency found in the design is with the insufficient detail and analysis of on-site conditions given to the materials handling system. This is the permanent rail conveyance upon which the transport of the electrical equipment (turbine, generator and transformers) will have to be moved from the upper level of the dam site to the powerhouse, which will be located at a lower level over a distance of some 260 meters. (see section V Findings).

IV. F I E L D V I S I T

A. DAM SITE

An on-site visit was made for this sub-project during April 28 to May 1, 1987. One is highly impressed by the altitude and terrain upon which this hydro-electric project is being constructed. The project at first glance from the construction that has been accomplished so far, and the on-going work that is presently underway, appears to be quality work and construction. Simply stated the project is relatively an uncomplicated, straight forward design of a small hydro- electric plant. However, it is set in a complex terrain feature where the entire construction of facilities is situated on a steep rocky mountain side. The construction of the dam and collecting pond is located some 100 meters from the natural upstream falls and water course. Eventually, when construction is completed, the water after passing through the turbine in the power house will return once again to its natural water course.

B. DAM

All construction is completed, except for the steel gate that is to be installed on the clean out pipe. The dam has a fine appearance. Modification however were made to both wing walls to take advantage of natural rock terrain features not shown on the plans. Facing the dam, the left wing wall was shortened about one meter and keyed into existing rock for better strength. As called for in the plans, the existing rock was to be cut off and the wall extended. This proved to be unnecessary. The right wing wall however was lengthen some two meters to take advantage of the natural rocky terrain. During construction, the water is being diverted into a small stream by the use of a temporary concrete and rock dam. When all facilities are completed this temporary dam will be removed so that the collecting pond can fill up to its required height.

The main dam (or face) rests upon a natural rock base. As originally called for in the plans, this face was to be tied into the bed rock by the use of a "key". The purpose of this "key" was to keep the dam from sliding or overturning from its rock foundation once it comes under pressure from the ponded water behind it. The key was to be a special designed elongated concrete block cut into the rock and keyed into the face of the dam when concrete was poured for its construction. This design feature had to be altered however since the construction contractor did not have the proper rock cutting tools to effectivly cut the required opening in the rock. An alternative however would have been to blast an opening with explosives, but the rock would have shattered making the existing rock protusion unduly weak for the sub-structure. Due to the lack of any further guidance from the construction contractor's engineer (D.V.V.) on how to cope with this situation, the field superintendent of works made a change in construction by drilling an adequate number of holes in the existing bed rock, install reinforcing rods, and then tying the rods to the main structure (or face) when the concrete was poured. This change was seconded in the field by CECA's Project Manager and the USAID/K engineer. To have done otherwise without another solution to the problem would have caused a serious delay in construction time.

C. PENSTOCK SUPPORTS

The required number of reinforced concrete block supports upon which the steel penstock pipe will rest are completed for the upper section. The lower section of the penstock is to be placed in a rock trench which will be blasted out in lieu of providing for an anchor block. All penstock steel pipe is on site ready to be assembled and laid in its proper position once the powerhouse is completed and the turbine installed.

D. STAIRS

The worker's stairs are complete except at the lower end where steel pipe hand rails are not yet in place. The steps are made of wood. Stairs are well constructed.

E. POWERHOUSE PLATFORM

The original location of the powerhouse as given on the design plans placed the structure too far out on a small rock ledge that is presently being extended by blasting and cutting away at the face of a rock cliff. It would be a monumental, as well as a very dangerous task to further extend this man-made ledge any further away from the face of the cliff. This ledge is some 97 meters below the dam. Work was in progress in cutting the face of the cliff and improving the rock ledge when the site visit was made. Because of this problem, the D.V.V. superintendent of works, without the help and guidance of a home office engineer, decided it would be best to cut an additional 3 meters more off the face of the cliff and bring the powerhouse that much further in on the rocky ledge. This change will preclude extending the ledge and will give added safety to the foundation of the powerhouse when it is constructed. While at the site visit, the ACEC engineer gave the civil engineer evaluator a design sketch showing this change.

- c) Because of the way the design and construction consortium was set-up between ACEC, BETEC, and D.V.V. there is apparently internal managerial and control problems concerning responsibility for the construction of facilities. Since construction began; D.V.V. has not taken an active role as the construction contractor other than having employed a superintendent of construction. In this regard the consortium is trying to sort out their affairs so that either D.V.V. becomes active or may have to be dropped from the consortium. If the latter happens, it is likely that the superintendent for construction may take legal action as stated above if not paid by D.V.V.; or he has the option of leaving the work. Any of these actions will place the completion of the project in jeopardy.
- d) It was learned at this meeting that CECA's Project Manager, who has been most active in the implementation of construction, is due to leave the mission on a normal rotation assignment sometime in the next few months. His departure will occur before the construction is completed. If a replacement is not onsite before he leaves and with the precarious status of D.V.V. and its superintendent, it could leave the construction without any supervision and thus come to a halt.

V. FINDINGS

A. CONTRACTOR SELECTION PROCESS

It appears that from the very outset of this process, ORT, through no fault of its own, was not properly guided by USAID/K as to the proper procedure it should take to contact and select design and construction services for capital projects. In sum, no "turnkey" contract is condoned by AID/W ; i.e. that both the design and construction are to be carried out by the same contractor for these services. If there are extenuating circumstances where a "turnkey" operation is necessitated, then a proper waiver is to be obtained by USAID/K from AID/W.

Thus the proper procedure in essence was to :

- * Advertise publically in a local news publication for firms that are qualified to undertake the design of a given facility. Give details of what the project is all about and what the design firms are required to do. Interested firms then send in their qualifications for evaluation, along with their proposal on how they will carry out the work.
- * When firms respond after a deadline for submission is established, firms are then ranked and short-listed. Usually the short list will contain only 2 firms.
- * The number one firm is then contacted and requested to submit a cost proposal.

- * Negotiations are then held - if both parties are in total agreement, then a contract is let for the design. If agreement is not reached, the number two firm is contacted for the same procedure; and so on until a design firm is finally under contract.
- * After the design is finished and accepted by all parties concerned, the same procedure as above is instituted in acquiring a competent construction contractor.
- * Lastly, the design firm (usually an architect-engineer firm or sometimes just an architectural firm) is usually retained to supervise construction and make necessary design changes.

For further details of the exact procedure to be followed, one should consult the appropriate AID Handbook series.

Generally, these are the steps to be followed - however, in view of how this project was developed and the procedure that was used in acquiring design and construction services, there was no competition among qualified firms, both in design as well as construction. It was noted that the flaw in the selection process should have been addressed during the engineering portion of the mid-term evaluation that was made some twelve months after the selection in June 1984 of the Consortium of BETEC-D.V.V.-ACEC.

As noted from the files, an internal CRT memorandum of June 17, 1985 entitled Project 097 Program Performance Report N°3 from CRT's Project Manager, surfaces the realization of the shortcomings involved in having a "turn-key" operation versus that of having a separate contract for design and another for construction. Apparently this realization became evident when numerous contractual difficulties arose with the Consortium's Construction Contractor D.V.V., and the remaining partners therein were helpless to take corrective action.

B. SAFETY AT THE WORKSITE.

It was observed and noted that D.V.V. was delinquent in many safety aspects at the construction site. Safety features are adequately described in Annex 1 of this report.

C. QUALITY OF MATERIALS.

From the quality of construction that was observed, good grade gravel, sand, steel reinforcing bars, and cement has been used in the process. The work so far is highly professional due to the diligence of the D.V.V. Superintendent of construction and CECA's Project Manager who saw to it that only good grade quality items were used in the construction of various facilities.

D. TESTING OF CONCRETE.

There was no testing equipment for concrete and gravel at the site. No tests were ever conducted on these items. The construction contractor D.V.V. never provided the necessary test equipment - nor took samples to have them tested at a testing laboratory facility. Nevertheless, sensing this short coming and relying on the past experience in selecting, mixing and batching materials, the D.V.V. Superintendent of construction used a greater proportion of cement in his mixes in order to acquire a higher safety factor. He stated his mixes of sand, gravel and cement had a ratio of 1:1:1 or 100 liters of gravel to 100 liters of sand to 1 bag of cement. It was noted that no engineer from any part of the Consortium took exception to this ratio - nor did anyone question it or request that he changes his mix. The cement used was produced in Zaire.

E. DAILY JOBSITE LOG

The D.V.V. Superintendent of construction is keeping a daily jobsite log on all activities of construction, men on job, work accomplished, problems, work schedules, materials used, materials on hand, materials ordered, delays in procurement etc..

F. CHANGE ORDERS

It was noted that no written change orders were issued by the D.V.V. Superintendent of Construction for those changes in design and construction that were initiated at the dam and relocation of the powerhouse. Thus, no revised plans have been made showing these changes. However, as stated in Section IV E, a design sketch showing the relocation of the powerhouse has already been made, but not recorded on the drawings.

G. TRAINING

It was evident the on-the-job training has been given by the D.V.V. Superintendent of Construction to the locally hired laborers. From the quality of work observed, they are well trained in a labor's tasks. The labor force fluctuates from a minimum of some 50 to a maximum of 100 depending on the work required for the day. Skilled workers, such as masons, formers, steelwork for the rebars, jack hammer operator, explosive experts, etc. are acquired from Kinshasa. The number of skilled personnel is placed at 15.

H. D.V.V.'S HOME OFFICE ENGINEERING HELP

There was no evidence or any reported that the D.V.V. Superintendent of Construction ever received any professional engineering help on the construction problems he has had in the past. He has had to rely in his ingenuity and the advice and help from CECA's Project Manager in solving various problems that have come up. Apparently, this has worked out well and these two gentlemen have a good working relationship.

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VI. C O N C L U S I O N S

- * That D.V.V.'s Superintendent of Construction is following the design plans for the construction of the hydro-electric facilities.
- * That additional design plans and forthought must be given by BETEC and D.V.V. for a safe and workable materials handling system.
- * That by selecting a "turnkey" operation for design and construction of facilities certain difficulties have arisen with D.V.V. that must be solved quickly so that the work may continue, and be finished within the shortest possible time. The construction phase, at this time is about 60% complete.
- * That field changes in design and/or construction to both the dam and power house location were fully justified and of sound engineering judgement.
- * That construction training is being carried out by D.V.V.'s Superintendent of Construction for local laborers.
- * That D.V.V. has been delinquent in the safety requirements for its on-site labor force that are normally provided for at a construction site.
- * That D.V.V. home office support engineering help made available to its Superintendent of Construction has been non-existent throughout the work thus far.
- * That the quality of work, workmanship, materials used etc.. is of high quality and fully acceptable for construction that has been accomplished to date.
- * That no testing of concrete was done - however stronger mixes were used for the concrete which will provide greater strength and safety to the facilities constructed thus far.
- * That reinforcing steel bars have been/and are being used where called for in the design plans for concrete structures.
- * That ORT's engineer should have made more visits to the site during construction.
- * That the working relationship between USAID/S, ORT, CECA and ACBC/BETEC regarding construction is good and in keeping with professional standards (D.V.V. is the exception in this relationship).
- * That the status of D.V.V. has to be defined for USAID/K, ORT and CECA. As of this date it is derelict in its responsibilities in not carrying out the terms of its contract with CECA for construction.

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- * That the status of D.V.V.'s Superintendent of Construction be determined. He has not been paid since he started work on project some two years ago, and thus may take legal action against the firm contract non-compliance, which if this takes place will automatically stop the construction.
- * That CECA's Project Manager is due to leave the mission shortly which will leave CECA without a Project Manager unless a replacement arrives before his departure.
- * That if all goes well; i.e. no labor problems arise, status of D.V.V. is settled, D.V.V.'s Superintendent of Construction is paid back wages, replacement of CECA's Project Manager arrives before the latter's departure, construction materials and equipment arrive as scheduled, mechanical and electrical equipment and materials test out OK after installation, etc., then it is believed that the construction for this project can be completed before November 1957.

VII. RECOMMENDATIONS

It is recommended that the following actions be taken as indicated :

- * That concrete testing equipment (for the testing of concrete samples) be provided by the Consortium or provisions made by the Consortium to have the samples tested at a private materials testing laboratory.
- * That "as-built" drawings be made after construction is completed by ACEC and BETEC of the entire facility taking into account all design and construction changes. That after "as-builts" are made, one complete set be given to the USAID/K's engineering office, and one complete set be given to CECA. The "as-builts" should be made available by the contractor prior to disbursement of funds for the final payment.
- * That Construction Contractor D.V.V. provide to its workers all safety equipment, drinking water, etc. as listed in Annex 1 of this report.
- * That a ladder be installed on the inside left wing wall of the dam near the clean out opening. (For safety reasons if a person accidentally falls into the pool).
- * That security lights be installed on top of the dam, staircase and powerhouse.
- * That all parties concerned, USAID/K, ORT, CECA and the Consortium of ACEC-BETEC-D.V.V. work out and find immediate solutions to problems as indicated in Section IV J above; in the interest of work continuity and completion of project.

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VIII. F O C U S O F E V A L U A T I O N

A. E F F E C T I V E N E S S

The construction phase of this project, thus far, has proved to be an effective method of bringing together a client with previous skills in management and operation of a mini-hydroelectric facility together with a professional design and construction firm, from the private sector, for purpose of constructing a new facility at a selected remote rural site. It is anticipated that although the construction phase is more than one-half completed, that the remaining portion can continue with the same vigor providing that all parties concerned within the consortium (ACEC-BFTEC-D.V.V.) mutually solve their internal disputes and keep as their first priority the completion of construction for this sub-project (see Section IV J).

This effectiveness is helping to achieve one of the purposes for this sub-project; i.e. "to test the economic and technical feasibility of the selected mode of implementation through a Private Volunteer Organization (PVO), contracting out to professional design and construction firms.

When the sub-project's construction is eventually completed and electric power is supplied to the Rethy Mission and neighboring villages, it may be concluded that this method of effectiveness helped to achieve the project's second goal; i.e. "to provide an adequate supply of electric power to meet present domestic, industrial, commercial and health needs, and to encourage growth in the commercial and industrial sectors of Rethy, Kwandrums and neighboring villages."

B. S I G N I F I C A N C E

The significance of the method of implementation of building this type of facility between a PVO and professional design and construction firms is that it has proven to the USAID/X project designers and programmers, that it is not only a feasible way of accomplishing the project but one that can be accomplished with the least amount of delay.

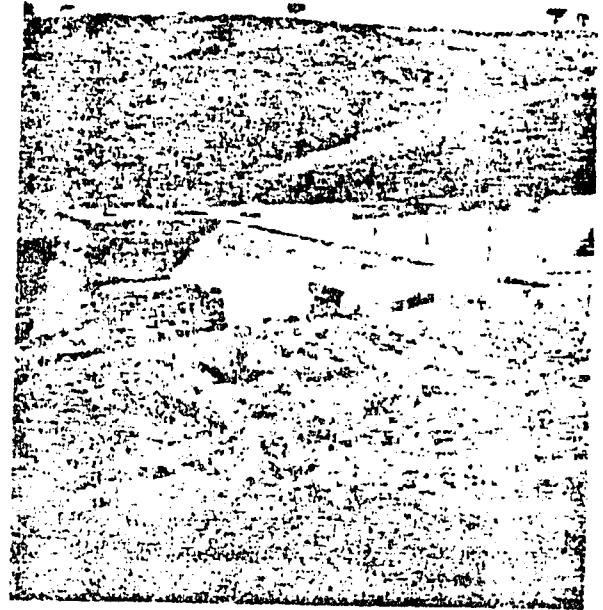
The project also is significant in that without its "being" it is difficult to visualize that the neighboring villages of the Rethy Mission would ever have electric power available to them within the foreseeable future.

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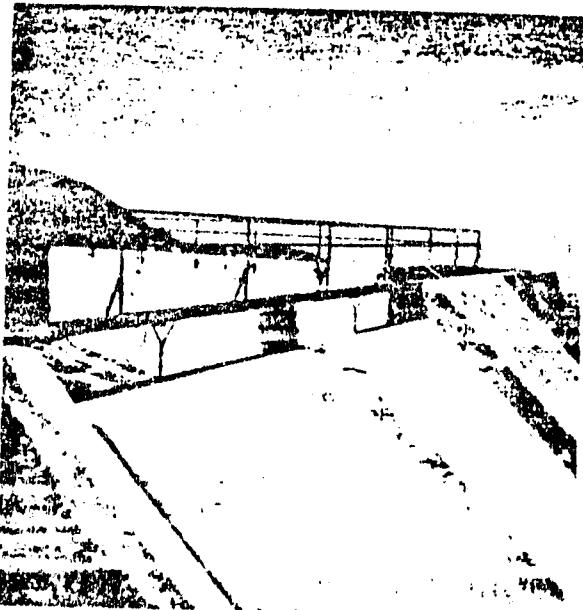
097 SUB-PROJECT
KODA MINI HYDRO-ELECTRIC
RETHY, HAUT ZAIRE



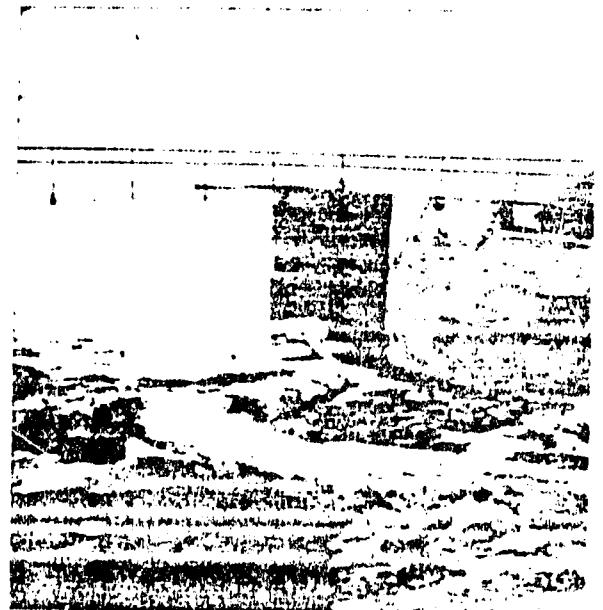
RETHY RIVER FALLS
UPPER END OF DAM



FRONT FACE OF DAM
BOTH WING WALLS



LOWER: OUTSIDE OF LEFT WING WALL



INSIDE OF DAM WHERE WATER
WILL BE IMPOUNDED. CORNER
SHOWS LOCATION OF ENTRANCE
TO PENSTOCK

EXHIBIT 1 VIEWS OF HYDRO PLANT CONSTRUCTION.

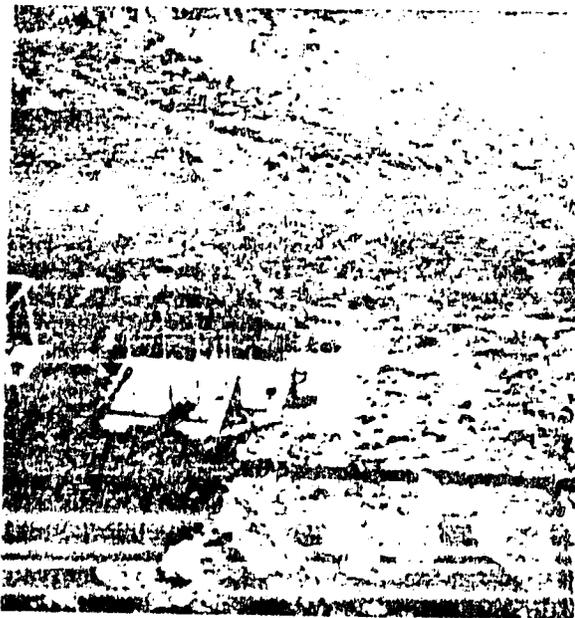
KODA MINI HYDRO-ELECTRIC
RETRY, HAUT ZAIRE



TO LEFT IS UPPER END OF STAIRS
TO RIGHT IS MATERIAL CONVEYOR SYSTEM
(STILL UNDER CONSTRUCTION)



LOWER END OF STAIRS



PILETOCK SUPPORTS (UPPER END)



ROCK CLIFF BEING CUT OFF
TO MAKE LEDGE WHERE POWER-
HOUSE IS TO BE LOCATED

EXHIBIT 2 VIEWS OF HYDRO PLANT CONSTRUCTION.

ANNEX 3

FINAL EVALUATION ENGINEERING REPORT

PART B

ELECTRICAL ENGINEERING REPORT

EXECUTIVE SUMMARY

During the field visit by the final evaluation team to the Koda sub-project site, construction progress was verified for the three electrical portions of the sub-project. Power plant and transformer station construction had not begun, underground cable transmission construction was almost complete, and overhead distribution network construction was about 50% complete. Other electrical supplies and equipment, with a major exception of transformers, were mostly available on site.

The quality of construction for the electrical system thus far completed was found to be good. Design specifications were being followed and accepted U.S. rural electrification construction standards were being met or exceeded. Design studies and calculations were reviewed in part only, since a thorough design review and approval had been previously completed.

1. Several recommendations were presented pertaining to the testing and the operation and maintenance of the completed facilities. Specific recommendations address the following points:

- o Outside technical assistance during power plant start-up and testing.
- o Purchase of high voltage cable testing and fault location equipment.
- o Provision of outdoor lighting around generation area.
- o Short-range and long-range training for those people responsible for operation and maintenance of the electrical facilities.

ELECTRICAL CONSTRUCTION STATUS

During the visit of the evaluation team to the Koda sub-project site (April 28 to May 1, 1987) it was apparent that, though the physical installation of the electrical facilities was far from being completed, substantial progress was finally being realized. Construction of the powerplant building itself had not yet begun. Final site work was still in progress, due to the work delays described elsewhere in the evaluation report and due to site modifications found necessary as excavation revealed the true nature of the mountain cliff area where the plant is to be located.

The high voltage cable portion of the system was estimated to be more than 90% complete. Essentially all of the 12 kilometers of underground 3-phase line had been placed in the hand-dug one meter deep trench. The cables had been covered and final cable splicing and testing was being done. Two of the three cables were completely spliced and had been tested to 5,000 volts D.C. The third cable had shown insulation defects during testing, and the defects were being isolated at the time of the visit. Two short 1-phase line taps remained to be constructed, along with all of the actual transformer connections, which could not be completed due to the fact that transformers had not yet arrived. It seems that the transformers originally built to fill the koda order had been destroyed in a warehouse fire while awaiting shipment, which meant that a second set of transformers had to be manufactured.

The low voltage distribution networks were estimated to be approximately 50% constructed. Most of the overhead wood poles have been set and the armament attached in both the Rethy and the Kwandruma areas. Part of the low voltage cables are in place and a few individual service drops and meter installations have been completed. Work is also continuing in both main areas as far as private wiring within the individual buildings to be served.

With the exception of transformers, it appeared that all or almost all of the electrical equipment to be installed was available on site. The turbine, generator, and control equipment was housed at the Koda falls plant site, awaiting completion of the building in which they are to be permanently housed. Cable, connectors, transfer switches, and other materials are being warehoused in a separate building within the Rethy mission area. Wiring materials have been delivered which should be sufficient for wiring about 100 houses.

ENGINEERING OBSERVATIONS AND EVALUATION

All of the individual pieces of power generator equipment were given a visual inspection to verify that they were indeed on site, that they met the design specifications, and that there was no obvious transportation damage or other problems which would hamper construction or operation. The turbine, flywheel, generator, governor, and electrical control assemblies all seemed to be in order. The nameplate data observed was in accordance with the design specifications. All of the rotating parts turned freely with hand pressure only, and there was no indication of loose or faulty bearings. The electrical controls and meters could not be tested, but appeared in order visually. There were no dents or scrapes to indicate transportation damage.

The 12,000 volt primary cable system (referred to by NRECA as "distribution" system since in the United States 12 KV is considered as a distribution voltage rather than a transmission voltage) utilizes #2 AWG copper conductor enclosed with 175 mil VIP insulation and sheathed by a full concentric neutral, also made of copper wires. The cable is rated for a maximum current of 150 amperes in conduit or 210 amperes when directly buried, which at 12KV corresponds to about 10 times the maximum power output of the hydro plant. Splices are made using Elastimold tape splicing kits, which have proven over many years to be dependable when installed correctly. They are, however, very labor intensive and consequently the quality of the finished splice is very dependent on the skill and training of the splicer. Makeup of one splice was observed during the evaluation visit, and in this instance the proper training and procedures for this type of splice were observed. It should be noted that all of the underground cable and associated components observed during the evaluation visit meet the accepted U.S. rural electrification standards.

The cable trench is hand dug to a depth of one meter. The cables are then placed in a horizontal plane with consistent spacing between cables to maintain a consistent phase relationship. Backfill is then returned to a depth of about 30 cm. At this depth a cable marking tape is put in the

trench, along with a telephone communication cable. The remaining trench is then backfilled to the original ground contour. There was no evidence of soil compacting procedures being used, implying that there is a possibility of trench erosion in areas where the terrain is not close to being level. It was noted that, in general, the soil excavated during trenching was almost ideal for this purpose. Except for in the area adjacent to the power plant site, there was very little rocky or other material which appeared likely to damage the cables. There is mostly a light sandy soil very well suited for underground cable bedding. There is a small length of swampy area along the cable route. In this area the cables were placed in PVC conduit and sealed at each end of the conduit for additional protection against mechanical damage and erosion by electrolysis.

Cable testing thus far is done with a 5,000 volt "megger", an instrument designed to measure high resistances under conditions of relatively high voltage. According to the contractor, cables have been tested while still on the shipping reels, after being laid in the trench, and again after splicing and terminations are completed. This megger is a very handy and useful instrument which will reliably detect the presence of insulation defects up to the voltage of the instrument. However it has two important limitations in this particular application. The first is that it cannot detect weaknesses in the cable which develop at voltages higher than 5KV. The second is that the instrument gives no direct information as to exactly where the problem is located. Trying to find the exact location of a fault on a cable section several kilometers in length can be a very slow and frustrating experience. By the end of the evaluation visit, a crew had spent more than a week trying to locate the source of a bad megger test and had not yet found the problem. If cable hypot/thumper equipment (to be described later in this report) had been available, it is probably that the problem or problems could have been found and repaired in a few hours, and without the need to introduce several new splices which are potential sources for future problems.

One sad note is that there has been at least one instance of vandalism or sabotage and one theft of about 50 meters of underground cable. Fortunately, enough extra materials were on hand to repair and replace the affected cable portions.

The construction of the low voltage distribution system, also known as the secondary system, that has been constructed thus far looks very good. Poles for the overhead secondary system are mostly treated eucalyptus poles with a length of 9 meters. The poles were dip treated locally at Rethy, and appear to be of good quality. The poles are buried to a depth of 15 meters. The overhead spans are relatively short, resulting in a basic clearance height of a little over 6 meters, or about 20 feet in British units. This clearance exceeds the U.S. standards for low voltage conductors and should be very adequate. A few spans have taller poles for additional clearance where appropriate, mostly for road crossings where high truck loads are anticipated. The type of conductors installed are standard duplex (2-wire) and quadraplex (4-wire) insulated cables, which will be much safer and more trouble-free than the open wire system at first considered. Many of the end

poles and angle poles which normally would have guy wires did not appear to have the necessary support to prevent tipping. However it was later explained that these poles have crib braces, consisting of horizontal logs buried just below ground level and against the pole, to provide the required support. This construction method is aesthetically pleasing and safer to the public since there are no overhead guy wires, and because of the short conductor span lengths should be adequate.

A few individual service entrance and metering installation have been completed, and based upon the sites visited should be appropriate for the applications. Typically, these are 30 ampere services, although the disconnect equipment and meters are adequate for a 60 ampere service.

It was noted that the main secondary networks in the Rethy area have been designed with transfer switches, so that they can be energized either from the hydro power plant or from the existing diesel generators. This allows the use of the existing power sources until the new plant is completed, and also provided a means of switching some electrical load to the diesel plant in the future if demand exceeds the hydro output. The transfer switches are interlock connected, so that only one power source can be utilized at a time. This is very important, since the power supply scheme does not include the synchronizing equipment, etc. necessary for the two types of generation to be operated in parallel.

The ACEC design studies were reviewed in connection with this evaluation. The items reviewed, including voltage drop calculations, appeared complete and correct. Some items, such as fault current calculations and time-current curves for system overload protection, were not specifically examined, since these items were covered and approved in a design review report by Edward Gather, P.E., of NRECA during April, 1985.

ENVIRONMENTAL IMPACT

The Koda hydroelectric project proposal, as submitted to USAID in July, 1984, stated that "The installation of a 330 KVA hydroelectric generating plant on the Koda river falls about 10 km south of Rethy, the laying of 10 km of underground transmission cable, the construction of utility buildings, substations, and distribution lines, with all of the related activities, will have minimal long-term impact on the local natural environment." The electrical facilities associated with this project have now past the point of maximum environmental impact. The hydro plant after completion will have less visual impact than is presently the case during site preparation. At the present construction stage, a visual change definitely exists, although only noticeable from a small area in the vicinity of the construction. Vegetation is now beginning to overgrow over some of the construction scars even before construction is complete. Since the penstock is not yet in place, diversion of the natural stream is not particularly noticeable.

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The underground line construction is mostly complete, with the ground surface now being returned to the original contours. The appearance of the completed cable route is very similar to that of a common footpath, except that the route is straighter than that of a common footpath. Without human traffic, the footpath effect will gradually blend back into the background. The secondary cable networks are readily visible but only within the populated areas. And since the new facilities are replacing old facilities which were at least as noticeable in the Rethy area, the total change in this area will be minimal. Since electrical facilities in normal operation emit very little sound and no detectible odor, the direct environmental effects are very small. Indirect effects will be more significant, mostly due to the fact that there will be regularly lighted places at night where before there were none, or almost none. General human population density and activity may also increase enough to be noticeable because of the available power. Overall, though, there will be as predicted minimal long term impact on the local natural environment.

RECOMMENDATIONS

The electrical system construction so far completed appears to be of good quality and to meet applicable design and safety standards. Therefore no changes are recommended at this time in system design, materials, and construction. However, several potential problems are foreseen in connection with the testing, startup, and operation of the system. To avoid or revolve these potential problems the following recommendations are made:

- 1) Arrange for a well qualified person to be on hand to assist with start-up and testing of the turbine-generator equipment. If it is possible, an Osberger representative would be the logical choice to have on hand. The first few hours of operation of a hydro plant are critical. Hydraulic, voltage or bearing problems during start-up can cause damage which could plague operations for years. The Osberger representative (engineer or plant operator) should be in a position to give the very best technical assistance and training and also could avoid or resolve potential legal or financial liability in the event of some equipment defect or improper start-up procedure.
- 2) Purchase a DC hypot/thumper unit for use on the Koda system. In the construction contract there is provision for a cable locator-fault finding unit. This unit should serve well for cable location and for finding certain cable faults, but it not designed for use on concentric neutral cables such as those in the Koda system. The hypot/thumper equipment is the only type of fault-finding unit voltage concentric neutral cable faults. This equipment is relatively expensive. However, it is very easily could make the difference (perhaps several time) of an outage measured in hours instead of one measured in weeks. Repair costs and/or revenues lost during one such lengthy outage would likely more than pay for the testing equipment.

2. The unit should be capable of applying a test DC voltage of 30KV or 35KV and should be operable in either a leakage current cable test mode or a thumper fault location mode. An external power supply will also probably be necessary, unless one is already available. This unit should be on hand at the time the cable is energized, if possible, since that is the single most likely time for it to be needed.
3. Provide outdoor lighting for the hydro plant and step-up substation area, stairway, and penstock intake areas. This recommendation is explained in greater detail in Part A of this annex. Since the facilities have been designed to be in operation 24 hours per day, there will be many occasions where lighting of these areas will be essential for proper operation and maintenance activities.
4. Utilize the time during the electrical system start-up and check-out procedures to implement intensive training of everyone involved with permanent operation. The system manager, plant operators, electricians, and other operations and maintenance people should all be incorporated at this time. It was already recommended that a person who is very knowledgeable about the power plant equipment be on site for assistance. If this person is not also qualified to instruct in the areas of electrical transmission and distribution, a second person with expertise in these areas should also be on site.

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Specific technical areas in which the Koda operations people must become qualified include the following:

- o basic principle of hydraulics, as they apply to plant operation
- o care, lubrication, and maintenance of bearings
- o operating principles of overcurrent, overvoltage, and frequency or speed relay controls
- o theory and procedures for changing transformer voltage tap connections
- o functions and operating principles of all plant and other system metering equipment
- o effects of power factor on system capacity
- o phase sequence of 3-phase circuits
- o procedures for system load pick-up and load shedding
- o monitoring and resetting of cable load (overload) indicator devices
- o procedures for locating and repairing high voltage underground cable faults
- o procedures and guidelines for testing transmission lines using DC hypot equipment (assuming this equipment will be available)
- o coordination of system protection equipment (fuses, breakers, and switches)
- o limitations of using two generation sources to serve a common electrical load
- o safety requirements and procedures for working on energized or recently energized transmission and distribution lines, particularly underground lines.
- o other safety aspects, such as suppression of electrical fires or first aid for electric shock victims.

All these technical training areas are above and beyond the basic training in electrical theory, wiring methods, power calculations, etc. which is already going on. It is imperative that training in the above listed areas be mostly in the form of hands-on practical experience and physical arts and skills which can be learned only from personal experience. Without the intensive training assistance recommended this personal experience and consequent skills will be obtained on a trial and error basis, often under a crisis atmosphere, and likely at a cost of much time, expense, and frustration.

5. Institute an ongoing program for technical review and training. Obviously it is not practical to provide such training through visits of outside technical experts on any kind of regular basis. It is also not realistic to assume that after only a few days or weeks of training, the relatively small and isolated group of people responsible for keeping the Koda facilities in operation will be completely qualified to do so, given the many different aspects of this technically oriented operation. Therefore it is recommended that the ongoing program consist of two principal parts.

The first part would be a regular scheduled time, perhaps weekly or monthly, reserved for technical discussion, review, and study, wherein all those involved in the technical operations can pool their knowledge and

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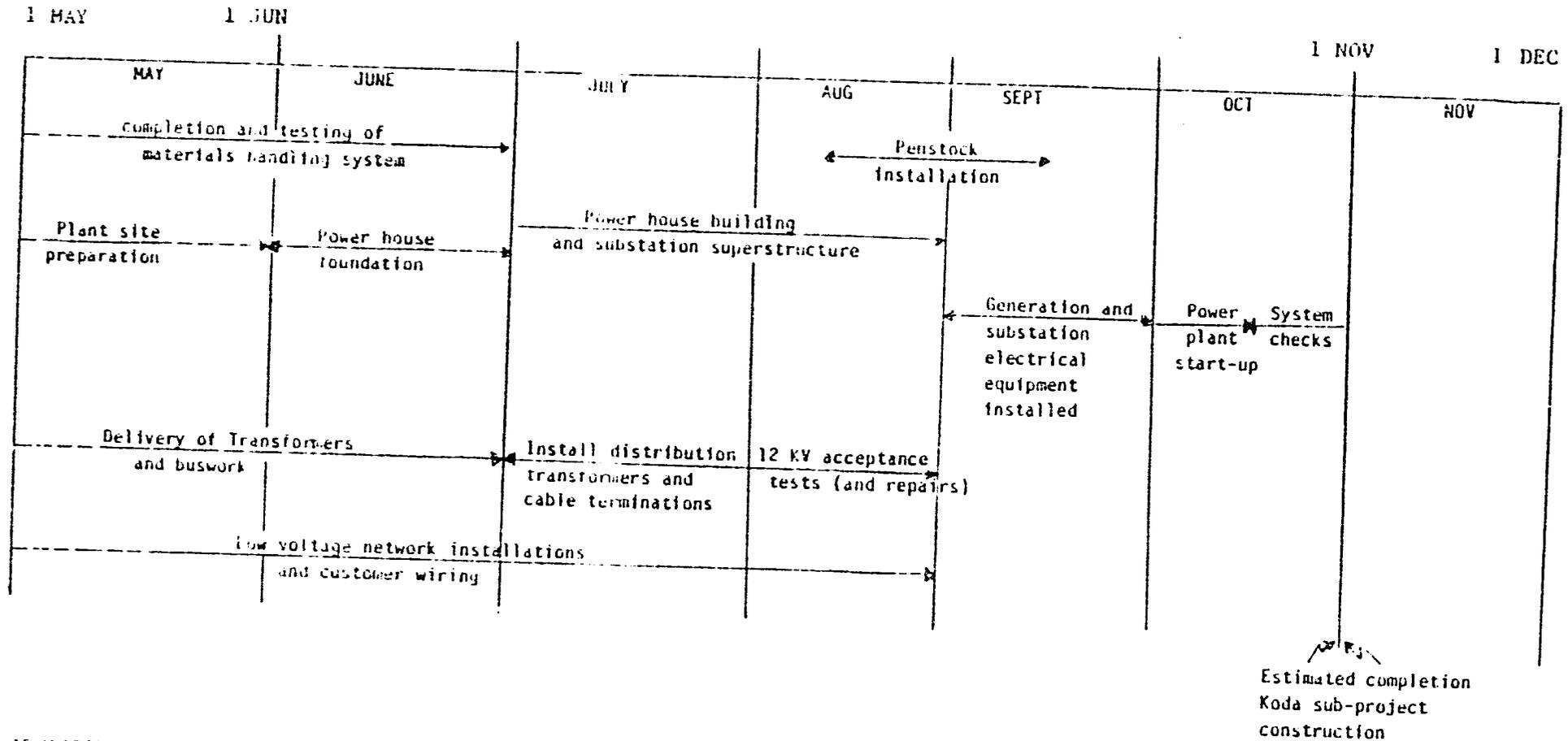
experience. Each person will learn different things from the intensive training period, and through group discussion this training will be expanded and reinforced. Technical materials, such as project design studies, engineering reports, and equipment manuals, will become more useful with additional study. Translation of these materials into locally useful languages would of course help greatly. Outside reference materials, such as electrical textbooks, seminar proceedings, and manufacturers' literature, should become more useful as time passes.

The second part of the training program would be to establish some type of information exchange with another utility system or systems. One possible utility would be Fall River Rural Electric Cooperative (with headquarters in Ashton, Idaho, U.S.A.) which has already shown interest in the Koda project. Although the system organization is not legally a cooperative one, NRECA (which sponsors a technical information exchange program involving "sister cooperatives") may be able to assist in finding other possible rural electric utilities. The cost of such an exchange program is usually minimal, and the long range support and assistance can be significant.

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ENGINEER EVALUATORS' PROPOSED SCHEDULE
FOR COMPLETION OF KODA SUBPROJECT
1987

PAGE 37



ASSUMPTIONS

This schedule is based on the following assumptions:

- o All necessary materials and equipment delivered at site as per schedule.
- o No delays in construction due to employee - management problems with construction company (BYV)..
- o Supervision of construction (BYV) and project management (CECA) remain constant for completion of sub-project.
- o Testing of materials and equipment shows no replacements are necessary

TRAINING

See elaboration in Part B - Electrical Engineering Report - for training recommendations.

SAMPLE WEEKLY TEST LOG FOR EXPORT SOLAR INSTALLATIONS

LOCATION _____

EXHIBIT 4

DATE	TIME	WEATHER	CURRENT AMPERES	BATTERY VOLTS	BATTERY FLUID LEVEL			OTHER COMMENTS	AUTHORIZED PERSON
					OK	LOW	NO. CELLS FILLED		

1) Battery fluid level in each cell should be within one cm. from plastic ring. If low, add DISTILLED water only to bottom of plastic ring.

2) Voltage of 13.0 or above indicates fully charged battery. Voltage of 12.0 or below indicates a discharged condition.

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Apr 85 NRECA Recommendation	Observations
1. Use 500 KVA step up station next to powerhouse.	1. Recommendation used in design.
2. 3 1-phase 167 KVA transformers	2. Accepted, transformers ordered
3. Underground rather than overhead distribution.	3. Underground system specified and installed.
4. Ungrounded, delta, 12KV cable system.	4. Specified as per recommendation.
5. 3-phase step-down transformers at the load centers	5. Incorporated into system design, for two small load centers.
6. 231/400 volt secondary system.	6. Specified as per recommendation
7. Phase load unbalances to be under 20%.	7. Recommendation included in design calculations.
8. Voltage drops on 400 volt feeders and service drops kept under 5%.	8. All peak load calculations show less than 5% drop from the standard 220/380 volt base service voltage.
9. CECA should conduct engineering inspections.	9. Inspections done to date by Paul Brown and by final evaluation team engineers.
10. Turbing-generator tested at no-load and full-load.	10. Not yet applicable.
11. Cable tested at high voltage.	11. Installation tests at 5,000 V DC. Plans for acceptance tests at 52000V DC.
12. 231/400 lines sequentially tested for proper operation.	12. Not yet applicable.
13. Complete "as built" drawings to be left with CECA.	13. Not yet applicable.

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ECZORT RURAL HEALTH SUB-PROJECT

EXECUTIVE SUMMARY

39 solar lighting and refrigeration installations, along with 2 solar water pumping stations were included in the ECZORT sub-project, making up a significant portion of the total project funds. Evaluation team members visited 8 of these installation sites. Based on these limited site observations, it is believed that project materials and construction were of good quality, except for the refrigeration units which have a 15% malfunction rate. The most likely reason for malfunction is a lack or loss of refrigerant. All electrical components of the installations were functioning well, although batteries are not receiving essential maintenance.

These solar installations appear to have a valid and justifiable basis, if reliability and value of service are the criteria rather than cost per unit of energy produced.

Recommendations all concern repair and maintenance of the solar installations, with the most urgent recommendations, being those to ensure proper storage battery maintenance. Specific recommendations are the following:

- o Provide distilled water at each site
- o Arrange for repair of defective refrigerators
- o Establish a weekly maintenance check, using a form such as the one shown
- o Establish a semi-annual technical maintenance review
- o Provide information to each site to assist with service and replacement parts.
- o Investigate methods to provide lightning protection

INTRODUCTION

The main engineering component of the ECZORT rural health sub-project is the installation photo-voltaic (solar) powered electrical facilities for the purposes of providing lighting, refrigeration, and water pumping to various PVO rural health centers. These centers are located in many different rural health zones throughout a large portion of Zaire. The facilities will help establish the benefits and cost effectiveness of using solar electric power to assist health services in remote locations where conventional fuel supplies are difficult to obtain and where maintenance and operation of thermal generation units is costly and unreliable.

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DESCRIPTION OF INSTALLATIONS

A total of 40 lighting and refrigeration installations were programmed for the ECZORT sub-project. Of this total, 30 installations had been completed by the time of the final evaluation. The evaluation team members were able to make on site visits to only 5 of the 30 installations, due to the remoteness of most of the rural health centers, the large distances to be travelled to make on site visits, and the considerable cost in both time and money to visit other locations. Three solar powered water pumping installations were also programmed into the sub-project. Of these, two installations have been completed and water well drilling is in progress at the third installation. All three of these sites were visited by team members. It must be recognized that the observations, conclusions, and consequent technical recommendations may not be applicable to all of the sites, since it was possible only to visit a few of the installations.

OBSERVATIONS

Based on observations of the installations visited, a typical refrigeration/lighting installation consists of an array of solar panel modules, a bank of storage batteries, a charger-regulator control unit, a 12 volt refrigerator, and one or more fluorescent lighting fixtures, along with necessary wiring and switches. The cost of a complete installation average roughly U.S. 6,000.

The solar arrays each contain a group of individual photo-voltaic electrical modules. The modules used in this sub-project are rated at 55 watts (peak) each at 12 volts. The peak rating corresponds to the power output expected at noon on a bright sunny day in a location where there is no significant haze or air pollution. In actual field installations, the average power throughout the daylight hours might be 30% to 50% of the peak rating. Several modules can be connected together in series or in parallel to increase the voltage or the current produced. A simple flat array consisting of 5 individual modules connected in parallel was typical, based on the sites visited. The arrays are mounted at an angle from horizontal, with the angle dependent on the location latitude or by moisture runoff considerations. For maximum yearly power output, the array should be tilted towards the equator. One of the arrays seen was tilted away from the equator; the rest were correct.

Solar arrays have no moving parts and thus are not subject to the mechanical complexity and unreliability associated with rotating generator equipment. They also differ in that the output is DC power rather than the AC power of normal generation units.

The storage battery installations in all of the sites visited were very similar, differing only in the storage capacity. The batteries were all located inside buildings and well protected from weather and from theft or damage by unauthorized people. The type of battery used for the sub-project installations is a standard heavy duty lead-acid cell battery. Each battery has 6 individual cells to make up the 12 volt battery. Contrary to the

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impression left by ECZ engineering people, the batteries observed are not of a sealed or "maintenance free" construction. The fluid level in each cell will gradually lower as the battery is charged and discharged. Periodically the fluid level must be restored by removing the cell cap and adding distilled water (water recovered through condensation of steam). It is important to use only distilled water, since other water contains minerals and chemicals which will interfere with the chemical action of the battery, thus shortening the useful life span. All of the battery cells checked during the on site visits had low fluid levels. In addition, no one contacted at the sites seemed to know that this maintenance was necessary.

The control units seen were of differing types, depending upon the size and kind of installation. Each unit, though, is made to perform the following functions:

- o measure and indicate the amount of current available from the solar panels.
- o measure and indicate the battery voltage level
- o use the above information to automatically control the amount of energy delivered to the battery or batteries, thus preventing overcharging, which would severely shorten the battery life.
- o provide switching points for manual control of power.

All of the control units appeared to be functioning properly at the time of observation. However, a couple of instances were reported wherein during lightning storms the regulator control contacts were fused together, thus disabling the automatic switching function. It was necessary in these instances to pry the contacts apart and smooth the contact surfaces to restore proper operation.

Two different kinds of refrigeration units were used in the sub-project. It was felt that it would be an advantage to compare Marvel (brand) refrigerator units, which are imported from the United States, and FNMA units, which are manufactured in Zaire. The two kinds of refrigerators are similar

The lighting was accomplished by using fluorescent fixtures, which contain 8 watt or 20 watt lamps. The fixture includes a special ballast which transforms the 12 volts available into the high voltage needed for fluorescent lamp operation. The illumination level from these fixtures would not be considered adequate for normal health care facilities; however it is a vast improvement over flashlights, candles, or darkness.

Good quality wiring materials and good workmanship were evident on these sub-project installations. All wiring runs were neatly made, with cables well trained and securely attached.

The two completed solar water pumping stations were both operating satisfactorily at the time of the evaluation visits, and no reports were heard of problems at other times. The larger of these stations is located at Sona-Bata Mission, in Bas Zaire. This installation contains a total of 32 modules, each rated at 55 watts peak, for a maximum capacity of about 1.7 Kilowatts, making it one of the largest solar powered installations in Zaire. The modules are mounted in 4 separate arrays clustered together and surrounded by protective fencing. The arrays and storage batteries are connected for operation at 24 volts instead of 12 volts. The pump motor was rated for 28 amperes at 24 volts, or in other terms it has a power output of a little more than one horsepower. The installation has been operating since December, 1986, and has shown to be able to operate for 5 continuous days without direct sunshine, based on a pumping schedule of 2.5 hours nightly. Water is normally pumped after dark only, in order to allow the local residents access to the limited supply of spring water during the day.

CONCLUSIONS

The solar power installations of the EC20RT sub-project, based on those that the evaluation team members were able to visit constitute a valid demonstration from which to evaluate the effectiveness of solar electricity in improving rural health care in Zaire. The electrical portions of these installations appear to be functioning properly and reliably, with promise to continue doing so with a minimum of maintenance. So far, the refrigeration equipment has a malfunction rate which is unacceptably high. The most likely cause of the malfunctions is projected to be a lack of compressor refrigerant, either due to leaks which developed during transportation and installation or due to improper charging by the manufacturer. It appears that required battery maintenance is not being done, which if not corrected will lead to permanently damaged batteries and system failures within a few months.

In the short term, solar installations cannot compete against other forms of electrical generation in terms of cost per kilowatt-hour of energy produced. Therefore, it seems appropriate to focus on the reliability and minimal maintenance factors which allow solar electricity to perform services that otherwise would not be available. A graphic example worth mentioning came to the attention of the evaluation team at the Nyakunde regional hospital, located in Haut Zaire. The solar installation at this hospital is used not only to refrigerate perishable drugs, but to provide all night

lighting to the intensive care ward and to furnish emergency lighting in the surgical operating room. In addition, the installation is utilized for back-up power for the hospital oxygen supply. Because the solar facilities were available for emergency use during unexpected failures of the normal power supply, the solar installation is credited already with directly saving several lives. Such applications make the cost seem much more reasonable.

ENVIRONMENTAL IMPACT

The impact of the solar installations upon the surrounding environment is very minimal. The outside panels are mounted at a height of less than 2 meters and so are visible, only from within a few meters distance. They are located adjacent to existing buildings which makes the total visual impact insignificant. All other installation components are located within existing buildings. No distinguishable sound or odor is produced, and the only waste products are minute amounts of hydrogen gas, oxygen gas, and water vapor, all of which are naturally present already.

RECOMMENDATIONS

The engineering recommendations stemming from the evaluation of the ECZORT solar installations all concern repair and maintenance of the equipment. They are as follows:

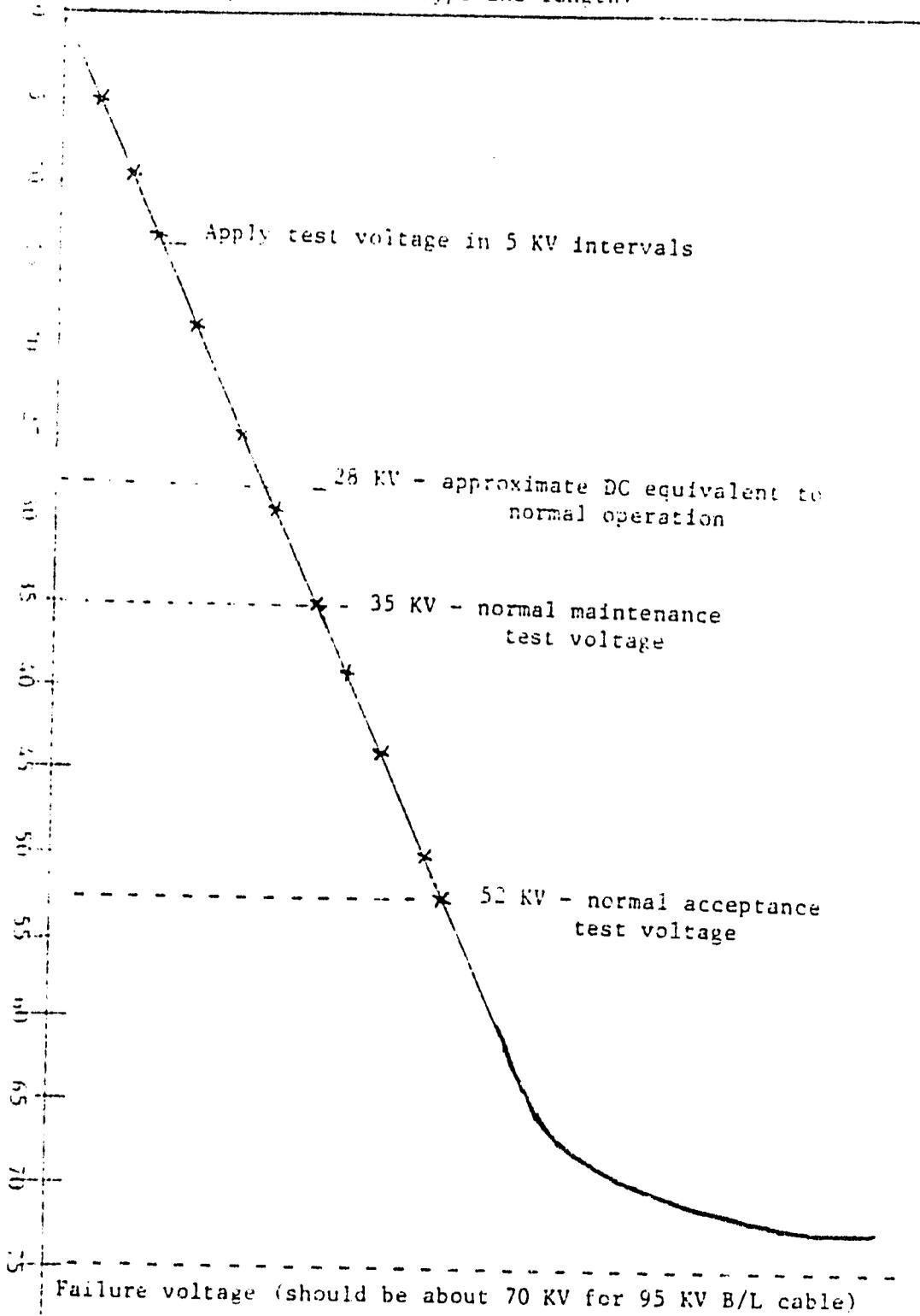
- 1) Distilled water must be made available at the storage battery location of each installation. Many of the sites may already have distilled water available, since it is often used for health services applications. Perhaps it can be distributed from the regional centers of each rural health zone. If necessary it can be made on site by any method of boiling water and collecting the steam as it condenses. No expensive equipment is required, but a little training and ingenuity may be necessary, along with patience and enough energy to boil water. As a last resort, other water is better than none, but it will always result in some shortening of battery life.
2. Arrange for a qualified person to inspect and repair the defective refrigeration units. Before doing this, it would be wise to find out (from product literature or from the manufacturer) the exact type of refrigerant used in the units. Freon is no longer the only product utilized, and any added refrigerant must be compatible with what is already there. In cases where there is in fact a lack of refrigerant, it should be documented as to whether the lack is due to a leak which may have been caused by transportation or installation or if it is due to a manufacturing problem. This documentation will help resolve who is financially liable for the repairs.

- 3) Establish a weekly log form for use in a maintenance check. The form should be simple, but should fulfill the following purposes:
 - o assist evaluation of the installations on a long term basis by documenting performance.
 - o provide information valuable for future designs. Regular current and voltage readings will, for example, reveal over a period of time whether the site has too many solar modules, if battery capacity is sufficient, etc.
 - o indicate impending problems or failures in time to avoid them. For example, frequent addition of water to batteries indicates overcharging conditions. A drop in average current readings indicates a defective solar module or bad connections, etc.
 - o train operating people how to perform regular and appropriate maintenance checks.

A suggested form is attached to this report see Exhibit 4. The form should be translated as appropriate.
- 4) If possible, it is recommended that a more technical maintenance check be made at each installation on a semi-annual basis. This may seem expensive or difficult to organize. However, if done by qualified people, it will extend the life of some expensive equipment. This also would be a logical means to gather weekly records, ensure that equipment is being properly utilized and maintained, gather ongoing evaluation data, and provide a means to distribute repair parts or supplies, as well as local training.
- 5) The next recommendation is to provide a card, sticker, or something equivalent on which is written the names and addresses of sources for service or replacement parts. Engineers or project managers in Kinshasa may know how to get a refrigerator serviced or where to buy a new 8 watt fluorescent tube, but indications were given that the person who may have to change the light tube does not know. The card or sticker could then be attached to the installation control panel for future reference.
- 6) The final recommendation is to investigate the need and methods of providing protection against lightning. There was not enough information obtained to determine the extent to which lightning damage may occur, but it could potentially be a serious problem in areas where lightning storms are frequent. Since solar panels function on the basis of light striking the panel surface, a nearby bright lightning stroke will cause a brief surge in the output of electricity. In addition, lightning can directly induce an electrical surge through the principle of induction; that is, the panel reacts to lightning more or less like a radio antenna. Together, these phenomena could potentially cause serious damage or failure. It is recommended that the equipment manufacturers and installers be contacted for their advice as to the availability and appropriateness

of surge protection devices. The cost of a surge protector should be relatively low. If nothing appropriate is available, a simple 500 volt, 0.1 microfarad (MF) capacitor wired to the wiring terminals of the control unit switch contact points would reduce the possibility of current arcing (welding) and voltage overloads due to lightning. Such a capacitor is available from electronics parts dealers for a cost of only a couple of dollars or less.

Leakage current after 2 min in UA
(numbers depend on cable type and length)



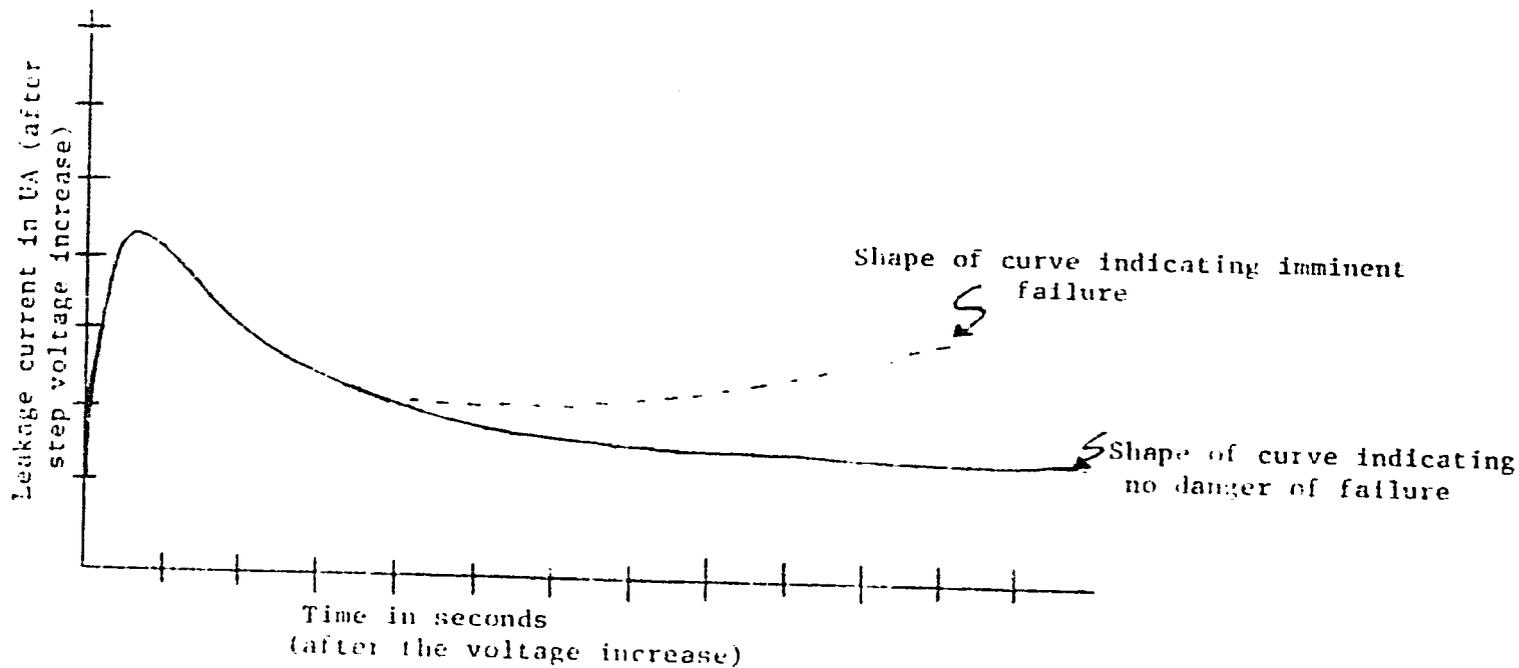
REFERENCE VOLTAGE / CURRENT CURVE FOR TESTING ROPDA UNDERGROUND CABLE

101

REFERENCE TIME/CURRENT CURVE FOR TESTING 100A UNDERGROUND CABLE

100

-48-



Note: Leakage current numbers will vary, depending on cable type, cable length, step voltage amount, and total applied voltage.

Time numbers will vary, depending on cable dimensions, cable length, and step voltage amount.

EXHIBIT 3

SAMPLE WEEKLY TEST LOG FOR HEZRET SOLAR INSTALLATIONS

LOCATION _____

EXHIBIT 4

DATE	TIME	WEATHER	CURRENT AMPERES	BATTERY VOLTS	BATTERY FLUID LEVEL			OTHER COMMENTS	AUTHORIZED PERSON
					OK	LOW	N. CELLS FILLED		

1) Battery fluid level in each cell should be within one cm. from plastic ring. If low, add DISTILLED water only to bottom of plastic ring.

2) Voltage of 13.0 or above indicates fully charged battery. Voltage of 12.0 or below indicates a discharged condition.

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ANNEX 3 - FINAL EVALUATION

ENGINEERING REPORT

PART C

REHABILITATION REPORT

HEALTH CENTERS REHABILITATION

A. WORK CALLED FOR

As a part of the overall ECZORT Rural Health sub-project there is a rehabilitation component for each of the rural health zones. This component seeks to improve and upgrade the physical facilities of the existing (old) dispensaries in order to provide a full range of health services called for under SANRU. The types of work called for under this rehabilitation program are:

- o Construction of water storage tanks
- o Construction of latrines
- o Fabrication of doors and windows/or repair of same
- o Cement floor patching or relaying
- o Roof repair or replacement
- o Painting/plastering of interior and exterior of buildings

It was anticipated that the buildings materials to be used for this work would be provided by project funds and all labor would be provided by the PVO local community as well as to provide locally available sand, stones and gravel.

It should be noted that ECZORT is introducing into each rural health zone improved water storage systems and latrine on a pilot basis. Both of these items are to be constructed with locally available materials and techniques.

B. SITE VISITS

The civil engineer had the opportunity of visiting only two sites in the Bandundu region, i.e. the "Zone de Sante Rural or Kajiji - MCC" SANRU, and the "Centre de Sante de Reference KINGWANGALA."

KAJIJI

There were five buildings involved in the rehabilitation at this hospital facility together with five latrines and one water storage facility operated by the newly installed solar operated pump. From the work done on the exterior painting of the buildings, there was evidence that this was accomplished, but there are once again in need of repainting. Local staff at this site stated that even though some \$2,000 was spent of paint from project funds, it was insufficient to paint all of the buildings. Other work noted:

- o Roofs showed no leakages and showed evidence of some repairs having been made and some had been painted.
- o There were no new latrines encountered.
- o There was evidence that some work was done on patching holes in cement floor toppings and a small amount of newly laid floors; however numerous cracks and holes have surfaced. All floors need to be refinished.

- o A new cisterne was seen (well constructed); water was being pumped using the new solar panel pump systems - all appeared to be working well.
- o Could not tell if new door frames, doors and windows were newly made since all are in need of various repairs - however there was all had previously been painted.
- o There was evidence of both plastering and painted of various walls in buildings, however all walls are in need of repainting.

Comment: From the work accomplished at this facility it appears that from using local skills in the building traders, painting, plastering, masonry, carpentry, etc. all was accomplished with reasonable care and passable, the cisterne however is well build and shows considerable skill in its construction. This task is a large one measuring some 3 meters deep and 6 meters in diameter. It is made of concrete and locally made cement blocks. All work at this site was done by local supervision and local labor from the PVO.

KINGWANGALA

This health facility has three buildings which were called for rehabilitation, namely, the dispensary, maturity and nurse's quarters. During the site visit it was pointed out that of the three buildings - no work was done to the nurse's quarters.

At this site, the local supervisor of repair and maintenance produced a list of materials that were used in the rehabilitation process as well as how much area was covered by each item. The list is as follows; although this list did not provide the quantities of each such as the number of gallons, bags, etc.:

- o Latex paint - covering some 826m²
- o Oil paint - " " 225m²
- o Cement - used to cover 161 m²
- o Tyrolean Crepi - A mixture of cement and sand and some paint "Lambris" to form a rough wainocot (grey in color) for the base of the exterior walls of the buildings. The upper parts of the exterior walls are painted white.
- o Window glass - enough to cover 0.80 M²
- o Triplex Ceiling material - enough to cover 55 M²
- o Chalk-lime - enough to cover 300 M²

In general, the same comments as given for KAJIJI apply here insofar as evidence that painting, plastering, masonry and carpentry work had been done to the buildings. However, at this time all buildings (including the nurse's building) are in need of repainting, floors need to be repaired and some plastering is needed to the interior walls of buildings. The workmanship and quality of work, using local standards of the trade, appear to be satisfactorily done and passable. There was no new latrines or newly constructed cisternes to this facility.

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As far as this sub-project is concerned based on these two facilities visited it may be assumed that all other health facilities that were destined to be included for rehabilitation are in the same state of repair. However, it is believed that the goals and objectives for rehabilitation for this sub-project have been achieved.

PRM:GWalker/nl
Document: 7491c
May 9, 1987

ANNEX 4

PROJECT 1967-00

DOLLAR QUARTERLY REPORTS FIRST QUARTER 1967 II US\$

BUDGET CATEGORY 4-US DOLLAR CODE	APPROVED BUDGET	EXPENSES THIS QUARTER	PREVIOUS CUMULATIVE	PRESENT CUMULATIVE	PRESENT BALANCE
4-1 MANAGEMENT					
1-1-0 CRT SALARIES & ADMIN SUPP.	753,535.00	76,307.24	597,203.56	609,271.72	64,266.16
2-1-0 BILINGUAL SECRETARY	41,431.20	1,256.00	45,237.60	53,447.60	-4,056.69
2-2-0 S.T. CONSULTANTS	27,037.00	0.00	30,740.00	30,740.00	-3,703.00
2-3-0 INVESTMENT	45,000.00	0.00	42,847.02	42,847.02	2,152.98
2-4-0 HOUSEHOLD FURNITURE	45,000.00	0.00	38,448.56	38,448.56	6,551.44
2-5-0 VEHICLES	20,000.00	0.00	19,937.26	19,937.26	62.74
2-6-0 INTERNATIONAL TRAVEL	80,000.00	397.00	62,749.34	63,146.34	-3,146.34
2-7-0 EXCESS BAGGAGE	4,000.00	0.00	2,117.80	2,117.80	1,882.20
2-8-0 AIR FREIGHT	78,800.00	227.00	16,434.63	16,561.63	12,138.37
2-9-0 MISCELLANEOUS	157,200.00	3,544.30	92,073.73	94,618.03	12,581.97
0-0-0 TOTAL MANAGEMENT	1,140,000.00	76,785.54	972,429.61	1,051,275.15	86,724.85

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PROJECT ORT-PVO 197

DOLLAR QUARTERLY REPORT FIRST QUARTER 1967

IN US\$

BUDGET CATEGORY	APPROVED BUDGET	EXPENSES THIS QUARTER	PREVIOUS CUMULATIVE	PRESENT CUMULATIVE	PRESENT BALANCE
<u>4-2 SUB-PROJECT FUND</u>					
4-2=1 DPP					
1-1-1 Bridges Procur. & Transp.	222,800.00	2,931.00	1,204,260.78	1,008,191.78	-76,191.78
1-1-2 Culverts Procur. & Transp.	100,000.00	0.00	102,657.45	102,657.45	-2,657.45
1-1-0 SUB-TOTAL COMMODITY	1,022,000.00	3,931.00	1,106,918.23	1,110,849.23	-78,849.23
1-2-1 T.A. for Design	4,000.00	0.00	0.00	0.00	6,000.00
1-2-2 T.A. for Training	12,000.00	0.00	0.00	0.00	12,000.00
1-2-0 SUB-TOTAL TECH. ASSISTANCE	16,000.00	0.00	0.00	0.00	18,000.00
1-3-0 CONTINGENCIES	95,000.00	-4,902.54	93,575.53	86,072.99	6,327.01
1-0-0 SUB-TOTAL DPP	1,245,000.00	-971.54	1,200,493.76	1,199,522.22	-54,522.22

PROJECT ORT-PVO 097

DOLLAR QUARTERLY REPORT FIRST QUARTER 1967

IN US\$

BUDGET CATEGORY	APPROVED BUDGET	EXPENSES THIS QUARTER	PREVIOUS CUMULATIVE	PRESENT CUMULATIVE	PRESENT BALANCE
4-2-2 ECZORT RURAL HEALTH					
2-1-1 Basic Drugs Proc. & Transp.	608,600.00	0.00	391,381.41	391,381.41	277,418.09
2-1-2 Books Proc. & Transp.	10,000.00	0.00	10,887.37	10,867.37	-887.37
2-1-3 Basic Equip. Proc. & Transp.	380,000.00	4,409.39	395,474.40	399,883.87	-19,083.87
2-1-4 Solar Projectors Proc.	13,000.00	0.00	11,800.00	11,800.00	1,200.00
2-1-5 Other Solar Equip. Proc.	320,000.00	340,299.60	6,300.00	346,599.60	-26,599.60
2-1-6 Motorcycles Proc. & Transp.	50,000.00	0.00	51,235.06	51,235.06	-1,235.06
2-1-7 Bicycles Proc. & Transp.	66,000.00	0.00	73,816.00	73,516.00	12,184.00
2-1-0 SUB-TOTAL PROC. & TRANSP.	1,528,400.00	344,708.99	940,694.82	1,285,403.81	242,996.19
2-2-1 Long-Term Tech. Assist.	24,000.00	5,429.00	47,118.77	53,547.77	-29,547.77
2-2-2 Short-Term Tech. Assist.	15,000.00	0.00	20,400.00	20,400.00	-5,400.00
2-2-0 SUB-TOTAL TECH. ASSIST.	39,000.00	6,429.00	67,518.77	73,947.77	-34,947.77
2-3-0 CONTINGENCIES	35,000.00	205.00	3,042.10	3,247.10	31,752.90
2-0-0 SUB-TOTAL ECZORT	1,602,400.00	351,332.99	1,011,255.69	1,362,558.66	239,801.32

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PROJECT CRT-PVQ 097

DOLLAR QUARTERLY REPORT FIRST QUARTER 1967

TI USE

BUDGET CATEGORY	APPROVED BUDGET	EXPENSES THIS QUARTER	PREVIOUS CUMULATIVE	PRESENT CUMULATIVE	PRESENT BALANCE
4-2-3 KODA HYDROELECTRIC					
3-1-1 Turbine Proc. & Transp.	166,118.00	0.00	160,223.93	160,223.93	5,894.07
3-1-2 Maintenance Equip. Proc.	40,000.00	7,651.75	0.00	7,651.75	32,348.25
3-1-0 SUB-TOTAL PROC. & TRANSP.	206,118.00	7,651.75	160,223.93	167,875.68	38,242.32
3-2-0 CONTRACTOR FEES	622,306.00	0.00	515,926.81	515,926.81	106,379.19
3-3-1 Tech. Assist. Design	15,000.00	0.00	11,922.41	11,922.41	3,077.59
3-3-2 Tech. Assist. Inspection	10,000.00	0.00	0.00	0.00	10,000.00
3-3-3 Tech. Assist. Training	6,077.90	4,885.71	17,836.17	22,721.88	-16,644.88
3-3-0 SUB-TOTAL TECH. ASSIST.	31,077.00	4,885.71	29,758.58	34,644.29	-3,567.29
3-4-0 CONTINGENCIES	43,099.00	406.00	0.00	406.00	42,693.00
3-0-0 SUB-TOTAL KODA	902,600.00	12,943.46	705,909.32	718,852.78	183,747.22
4-0-0 EVALUATION	60,000.00	0.00	18,489.71	18,489.71	41,510.29
5-0-0 CRT PROC. SERVICES	150,000.00	0.00	150,000.00	150,000.00	0.00
0-0-0 TOTAL SUB-PROJECT FUND	3,860,000.00	363,314.91	3,086,148.48	3,449,463.39	410,536.61
4-0-0-0-0 GRAND TOTAL PROJECT 097	5,000,000.00	442,100.45	4,058,638.09	4,500,738.54	499,261.46

1967

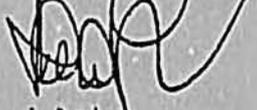
CO-OPERATIVE AGREEMENT No. AFB-0097-A-00-3092 FOR PVO SUPPORT PROJECT IN ZAMBIA

FINANCIAL REPORT No. 26

SUMMARY OF EXPENSES TO FEBRUARY 1987

	<u>January</u> <u>Feb. 1987</u> <u>US\$</u>	<u>Adjusted</u> <u>Cumulative</u> <u>to Dec. '86</u> <u>US\$</u>	<u>Cumulative</u> <u>to Feb. '87</u> <u>US\$</u>	<u>BUDGET - OCT. 83</u> <u>TO OCT 1987</u> <u>US\$</u>
1.11 SALARIES & ADMINISTRATIVE SUPPORT				
1) Basic Salary	24,928.68	334,317.58	419,246.56	410,366.00
2) Education Allowance	2,362.00	14,905.74	17,267.74	30,000.00
3) Family Allowance	301.62	6,251.34	6,552.96	7,200.00
4) Fringe Benefits	3,530.86	73,225.57	78,866.53	89,482.00
5) Backstopping	6,318.12	94,736.74	101,054.86	107,833.00
6) Over head (Field Office)	4,237.90	67,034.17	71,272.07	70,233.00
7) Overhead (Home Office)	1,074.07	16,106.26	17,180.33	18,343.00
Sub-Total	42,753.55	662,681.50	711,435.05	733,537.00
1.12 Bilingual Secretary (Local Hire)	3,800.00	52,390.69	56,190.69	43,431.00
1.13 Short-Term Consultant (Fee/P.Diem)	-	30,740.00	30,740.00	27,032.00
1.14 Investment (Off. Equip. & Furn.)	-	42,847.32	42,847.02	45,000.00
1.2 OTHER DIRECT COSTS				
1.21 Household Furniture	-	38,448.56	38,448.56	45,000.00
1.22 Vehicles	-	19,937.26	19,937.26	20,000.00
1.23-1.25 Travel & Transport	1,514.34	110,645.54	112,159.88	112,800.00
1.26 Miscellaneous	377.00	96,479.96	96,856.96	107,200.00
Sub-Total	48,444.89	1,060,170.53	1,108,615.42	1,140,000.00
2. SUB PROJECT FUND				
2.1 DPP Farm to Farm Market Road	-	1,195,591.22	1,195,591.22	1,145,000.00
2.2 Escort Rural Health	-	1,380,076.86	1,381,078.89	1,602,400.00
2.3 Koda Mini-Hydroelectrification	-	732,362.75	732,362.75	902,500.00
2.4 Evaluation	-	18,489.71	18,489.71	60,000.00
2.5 OBT Procurement Services	-	150,000.00	150,000.00	150,000.00
TOTAL US\$	48,444.89	4,536,693.09	4,585,137.98	5,000,000.00

AMERICAN VET FEDERATION



I. Engel,
Director of Finance and Administration.

cc: B. Feldman, Director of International Co-operation
A. Lear
L. Fox

ANNEX 5

PROJECT ESF/PVO 660-0097

DOLLAR COMMODITY PROCUREMENT

<u>DESCRIPTION</u>	<u>COST</u>	<u>SUPPORTING DOCUMENT</u>
<u>I. PROJECT MANAGEMENT</u>		
A. Office equipment/Furniture	\$ 42,874.02	Inventory Pgs. 1-4
B. Household Furniture/Appliances	\$ 38,448.56	Inventory Pgs. 5-11
C. Vehicles	\$ 19,937.26	Inventory Pg. 1
Sub-Total	\$ 101,232.30	
<u>II. SUB-PROJECTS</u>		
<u>A. D.P.P. ROAD & BRIDGE</u>		
1. Bridges	\$ 1,008,191.78	Control Sheet
2. Culverts	\$ 102,657.45	Control Sheet
3. Front-End Loader	\$ 81,293.25	Control Sheet
Sub-Total	\$ 1,192,142.43	
<u>B. ECZORT RURAL HEALTH</u>		
1. Basic Medicines	\$ 391,181.91	Control Sheet
2. Learning Materials	\$ 10,887.37	Control Sheet
3. Basic Medical Equipment	\$ 399,883.87	Control Sheet
4. Solar Projectors	\$ 11,800.00	Control Sheet
5. Solar Refrigerators & Pumps	\$ 346,599.60	Control Sheet
6. Motorcycles	\$ 51,235.06	Control Sheet
7. Bicycles	\$ 73,816.00	Control Sheet
Sub-Total	\$ 1,285,403.81	
<u>C. KODA MINI HYDROELECTRIC</u>		
1. Turbine, Generator, Penstock	\$ 160,223.91	Control Sheet
2. Maintenance Equipment	\$ 40,000.00	Control Sheet
3. Elec. Cable & Transformers	\$ 422,306.00	
Sub-Total	\$ 622,529.91	
<u>D. PROCUREMENT SERVICES</u>		
1. ORT PSA	\$ 150,000.00	ORT Invoice
Total Sub-Project Procurement	\$ 3,250,076.20	
Total Project Procurement	\$ 3,351,308.50	

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ORT KINSHASA
INTER-OFFICE MEMORANDUM

ANNEX 6

To GARY WALKER, TEAM LEADER
From LESLIE FOX, PROJECT MANAGER
Re FINAL EVALUATION
PROJECT ESF/PVO 660-0097

Ref. :
325/LF/87
Date :
07/05/87

ISSUE 12 : Institution Building/Management Training Through the PACD

As per your request, I will briefly summarize, by sub-project, the types of above referenced interventions which we would be capable of undertaking (providing finances were available) through the PACD of September 30, 1987. These proposals follow those discussed in our December 9, 1986 submission to USAID concerning the use of obligated but unspent project Dollars.

1. D.P.P. SUB-PROJECT

- A. Institutional Re-Organization : ORT has assisted the Diocese of Idiofa, through a series of institutional analyses and facilitation workshops, to define a new organizational chart for D.P.P. and COMBILIM. This includes recommendations concerning the internal organization of each entity, the relationship between them, as well as the role of the Diocese itself in the delivery of social and economic services to the surrounding population.

The work remaining to be done is to codify in more detail the functional responsibilities, within and between these entities, and to develop job descriptions for personnel who will occupy the newly defined positions. In short, to operationalize the series of recommendations which came out of the previous facilitation workshops.

A sub-set of this institutional re-organization would be to focus on the micro or local level of service delivery. The focus would be at the level of the Parish and its structural and functional relationships with the local people (through their development committees)

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on the one hand and the Diocese (through D.P.P. and COMBILIM) on the other. We believe that the structure of the Diocese should be seen in terms of a development model and thus strengthened in order to provide more effective development assistance.

- B. Management Training : During the course of five separate training sessions ORT upgraded some 23 D.P.P./COMBILIM senior and middle managers in general management skills. With the application of recommendations leading to a new organizational structure and the new responsibilities as defined in their job descriptions, these managers will most likely need specific management skills in order to properly discharge their responsibilities. Given the time remaining, the most we could expect to accomplish would be to identify the specific skills lacking and recommend appropriate training interventions.
- C. Financial Management : Through a short-term consultancy with TECHNOSERVE-Zaire, a new accounting plan and guide have been developed for use by D.P.P./COMBILIM. Once the recommendations for the institutional reorganization have been executed then the new accounting system can be put in place. This will include developing financial systems and procedures within which the accounting plan and guide can be effectively used.
- D. Development Plan : As a final step, and one which would tie together the preceding set of interventions, we would propose assisting D.P.P./COMBILIM to come up with a short-term development plan (one to three years) as a way to determine the allocation of their resources within the new set of circumstances.

Conclusion

Ideally, all these propositions need to be implemented in order to put D.P.P./COMBILIM into a position to effectively manage the services which they have chosen to provide. Realistically, the three-to-four months which remain to the PACD can only be used to initiate these interventions in the sense that at a minimum, 6-to-12 months will be required to work out the bugs which are inherent to the nature of what is being proposed i.e. institutionalization.

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2. ECZORT SUB-PROJECT

The final management training module revisions which were started in late February 1987 are, at the time of this writing being typed up in first draft. They must then be substantively reviewed by the concerned agencies which have participated in this exercise from its inception before final production and printing can commence.

3. KODA SUB-PROJECT

- A. Institutional Organization : The organizational structure which is to be set-up to operate and manage the KODA hydroelectric facility has not as yet been finalized. We anticipate that the final evaluation will have fairly specific recommendations on this issue and thus will need to be incorporated into the organizational structure. Legal issues have been addressed and draft statutes for the organization have been completed. They will have to be modified accordingly and then operationalized.
- B. Management Training : The CECA Project Manager has been trained in the management of the hydro-electric facility. As he will be leaving in early-July he must transfer this knowledge to a newly designated Project Manager who will then be responsible for training a Zairean General Manager over a one-to-two year period. ORT needs to ensure the transfer between the two Project Managers and encourage CECA to hire immediately, the General Manager.
- C. Determination of User Fees : ORT, through consultancies with NRECA and Duncan, Allen and Mitchell has established preliminary rate structures for the sale of electricity from the KODA system. The final evaluation will most certainly comment on our proposal and make recommendations concerning the final rate structures to be used. Based on these recommendations we will go back to NRECA and DAM to finalize the rate structures before submission to the Department of Energy for its approval.

Conclusion

Regardless of how soon these activities are started, we

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cannot hope to see an effective organization managing and covering its costs by the PACD. Since the system will not come on line until the end of October 1987 there will be no follow-up to assist CECA in working out the types of institutional problems previously discussed. The most we can hope for is to obtain CECA's agreement to put into place the systems, procedures and policies which we hope to have completed by September 30, 1987.

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ANNEX 7

List of Persons Consulted by the Evaluation Mission

I. USAID/Kinshasa

- | | |
|---------------------|-----------------------------------|
| 1. Dennis Chandler | Mission Director |
| 2. Arthur Lezin | Mission Deputy Director |
| 3. John Bierke | Program and Evaluation Officer |
| 4. Kate Newman | USAID PVO Support Project Officer |
| 5. Carol Felkel | USAID PVO Support Project Officer |
| 6. Tim Born | Projects Officer |
| 7. Debra Rectenwald | Evaluation Officer |
| 8. Stephen Vance | Evaluation Officer |
| 9. Cit. Mulambo | Engineer |

II. Government of Zaire

- | | |
|-------------------|--------------------|
| 1. Cit. Kyamusoke | Department of Plan |
|-------------------|--------------------|

III. ORT/Kinshasa

- | | |
|----------------------|--------------------------------|
| 1. Leslie Fox | Project Manager |
| 2. Laurie Emrich | Health Coordinator |
| 3. Cit. Tabaro Tchim | Asst. Mgt. Training Specialist |

IV. ECZORT Sub-project

- | | |
|---------------------|------------------------------|
| 1. Cit. Nlaba Nsona | Administrator |
| 2. Franklin Baer | Asst. Administrator |
| 3. Steve Brewster | Technical Coordinator |
| 4. Dr. Tswakata | Medecin Chef de Zone/Kimpese |

V. D.P.P. Sub-project

- | | |
|------------------|---------------------------------|
| 1. Mgr. Biletsi | Bishop of Idiofa |
| 2. Abbe Phulushi | Executive Coordinator |
| 3. Cit. Mampasi | Head of Infrastructure Division |
| 4. Cit. Munkoko | Director of COMBILIM |
| 5. Cit. Lau | Head of Personnel and Admin. |
| 6. Cit. Fnore | Head of Accounting & Finance |
| 7. Citne. Ngabo | Head of Social Service Division |
| 8. Cit. Itongo | Secretary to Pere Ribaucourt |

VI. CECA Koda Falls Sub-project

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|------------------|-------------------------------|
| 1. Paul Brown | CECA project manager |
| 2. C. Haesevoets | Director of Installation/ACEC |
| 3. Mr. Bixhain | ACEC/DVV On-site Work Foreman |
| 4. Mr. Baeten | DVV Representative |

VII. Evaluation Team

- | | |
|----------------|----------------------------------|
| 1. Gary Walker | Team Leader |
| 2. Bill Baron | Civil Engineer |
| 3. Ngay Aben | Management & Training Specialist |
| 4. Ross Turner | Electrical Engineer |

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ANNEX 7

List of Persons Consulted by the Evaluation Mission

I. USAID/Kinshasa

Lenzin

1. Dennis Chandler	Mission Director
2. Arthur Lenzin	Mission Deputy Director
3. John Bierke	Program and Evaluation Officer
4. Kate Newman	USAID PVO Support Project Officer
5. Carol Felkel	USAID PVO Support Project Officer
6. Tim Born	Projects Officer
7. Debra Rectenwald	Evaluation Officer
8. Stephen Vance	Evaluation Officer
9. Cit. Mulambo	Engineer

II. Government of Zaire

1. Cit. Kyamusoke	Department of Plan
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III. ORT/Kinshasa

1. Leslie Fox	Project Manager
2. Laurie Emrich	Health Coordinator
3. Cit. Tabaro Tchim	Asst. Mgt. Training Specialist

IV. ECZORT Sub-project

1. Cit. Nlaba Nsona	Administrator
2. Franklin Baer	Asst. Administrator
3. Steve Brewster	Technical Coordinator
4. Dr. Tswakata	Medecin Chef de Zone/Kimpese

V. D.P.P. Sub-project

1. Mgr. Biletsi	Bishop of Idiofa
2. Abbe Phulushi	Executive Coordinator
3. Cit. Mampasi	Head of Infrastructure Division
4. Cit. Munkoko	Director of COMBILIM
5. Cit. Lau	Head of Personnel and Admin.
6. Cit. Foure	Head of Accounting & Finance
7. Citne. Ngabo	Head of Social Service Division
8. Cit. Itongo	Secretary to Pere Ribaucourt

VI. CECA Koda Falls Sub-project

1. Paul Brown	CECA project manager
2. C. Haesevoets	Director of Installation/ACEC
3. Mr. Bixhain	ACEC/DVV On-site Work Foreman
4. Mr. Baeten	DVV Representative

VII. Evaluation Team

1. Gary Walker	Team Leader
2. Bill Baron	Civil Engineer
3. Ngay Aben	Management & Training Specialist
4. Ross Turner	Electrical Engineer

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Annex 8

ORT Financed Staff (Long Term)

Name	Title	Starting Date	Termination
Jack Arad* 1984	Admin/Fin Dir.	April 15, 1984	Oct. 31,
Leslie Fox 30,1987	Project Mgr.	March 16, 1984	Sept.
Roland Moens** 1984	Roads Spec.	April 1, 1984	Dec. 31,
Laurie Enrich 1986	Health Spec.	Oct. 22, 1984	Dec. 12,
Didier Cahen 1985	Adm/Fin Dir.	Nov. 15, 1984	July 16,
Dan Goder 1987	Proj. Engineer	Jan. 8, 1985	Jan. 7,
Jean Dehasse	Mgt. Spec.	Nov.11,1985	Mar. 15, 1987
N. Dhrolia*** 1985	Bilingual Sec.	Dec. 23, 1983	Mar. 30,
Lucia Calvo 1987	Office Mgr.	Mar. 11, 1985	May 31,
Steve Brewster+ 1987	Tech. Coord.	Nov. 4, 1984	Mar. 15,

- * TDY status from Nov. 23, 1983 to April 14, 1984
- ** Hired and paid by ORT/London from short term consultant line item to assist in project management
- *** Hired locally by project management & paid by ORT/London
- + Hired by ECZ & paid by ORT/Washington

In addition, numerous short term consultants were used to provide technical and engineering inputs (e.g. Technoserve, NRECA).Team:nl

ANNEX 9

Final Evaluation

Scope of Work

PVO Economic Support Project 660-0097

April 13 - May 16, 1987

I. Background:

The Organization for Rehabilitation through Training (ORT) under a Cooperative Agreement with USAID, is responsible for the overall management of this project. The project is expanding and strengthening the long-term capability of PVOs operating in Zaire. ORT selected and USAID concurred in three subproject activities which are now overseen by ORT and implemented by local PVOs. The three subprojects are involved in the following activities: the improvement of rural health care delivery systems by supplying medical equipment and rehabilitating clinics; the rehabilitation of rural roads by constructing bridges and installing culverts; and the construction of a mini-hydroelectric facility. Each subproject contains a training component.

II. Evaluation Purpose:

This is the final evaluation of the PVO Economic Support Project. The objectives of this evaluation are the following. These points should be considered by the evaluators when examining all aspects of the project.

- A) To determine if the project objectives as outlined in the Cooperative Agreement have been met, if planned outputs were accomplished, and the extent to which the achievement of the objectives has contributed to the project goal and purpose.
- B) To determine if the institutional capacity of the subgrantees to implement development projects has been upgraded as a result of this project, and if the subgrantees will be able to sustain such activities after the PACD.
- C) To determine if this project can be used as a model for the design of future PVO assistance projects in Zaire, and to make recommendations for such a design based on specific successes and failures of this project. Was the mechanism of using an intermediary organization to manage several PVO assistance projects successful and appropriate for future use? Was an American PVO the appropriate type of intermediary? Was the project efficient - did the benefits justify the costs?

III. The Evaluation Report:

The contractor will submit a final evaluation report before the end of his contract. The report will be limited to 15 pages and will be prefaced by an executive summary of no more than two pages (additional comments and analyses may be appended to the report). The contractor will address the questions and issues listed in this scope of work, as well as pertinent evaluation issues listed in the Zaire FY88 ABS (Annual Budget Submission).

IV. The Evaluation Team:

The evaluation team will be composed of four members.

A) The team leader:

The team leader will be responsible for producing a final evaluation report before May 12, 1987. He will be assisted by an electrical engineer, a civil engineer, and a management/training specialist.

He will be responsible for coordinating the logistics of the evaluation with ORT and USAID, assigning specific responsibilities to the other team members in order to clarify their scopes of work, and editing and coordinating the reports of the other team members.

He will also be responsible for evaluating the overall management of the project.

B) The management/training specialist:

The management/training specialist will be responsible for evaluating the health subproject activities. He will also assist the team leader in examining management and training activities in the other two subprojects.

C) The civil engineer:

The civil engineer will be responsible for evaluating the civil construction in the mini-hydroelectric subproject, the structural rehabilitation activities in the health subproject, and the bridge construction and culvert installations in the farm-to-market roads subproject.

D) The electrical engineer:

The electrical engineer will be responsible for evaluating the solar equipment installations in the health subproject, and the electrical aspects of the mini-hydroelectric subproject.

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V. Evaluation Issues:

The members of the evaluation team will evaluate the components of the project for which they are responsible in the context of the principal objectives of the evaluation as noted above. They will also address, but will not be limited to, the following issues.

A) Project Management:

The evaluators will assess ORT's overall capabilities and effectiveness as the implementing agent. They will determine whether scheduled project outputs have been completed satisfactorily, and will address, but will not be limited to, the following issues.

1. ORT's provision of technical assistance to the project.

Were the types of TA, both long- and short-term, appropriate? Were the individuals qualified? Were they on site and working in a timely manner? Did they spend enough time in the field with the local PVOs they were assisting?

In the context of planning a future project, address the following questions. Were four permanent expatriates necessary or could the project have used more short-term TA for specific tasks? Was it appropriate to have most of the long-term TA on the management team in Kinshasa or would it have been beneficial to have assigned them to each sub-project in the field (see above)? The Cooperative Agreement originally called for a procurement specialist on the management team: Would this have helped the TA spend more time in the field?

2. ORT's performance in the procurement of commodities for the project.

Was the procurement of commodities conducted efficiently? Did the ORT/US procurement office provide adequate and satisfactory procurement services to the project? Was a system set up to efficiently distribute commodities to their field destinations?

3. Project monitoring and coordination:

Did ORT adequately monitor project activities in the field? Did USAID supply adequate assistance when needed? Did the subgrantees find communications with ORT sufficient and helpful?

4. Financial Management:

Were the management systems (i.e. accounting, property control, and financial procedures) established by ORT and the subgrantees effective and efficient enough to ensure the proper use of USG funds. Review the recent counterpart fund audit and all dollar vouchers in determining the above.

Were the required financial reports submitted to USAID regularly and on time? Did they contain sufficient information to allow USAID to assess the financial status of the project at any given time?

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B) Subproject Management:

The evaluators will determine if scheduled subproject outputs as outlined in each subproject paper have been accomplished. In each of the three subprojects the evaluators will also address, but will not be limited to, the following questions and issues.

1. Advise if subproject objectives were realistic in light of the PACD and project funding levels.
2. Are PVOs now more capable of using donor funding and implementing development projects than before project commencement?
3. Review the subproject training plan. Was the training plan well thought out and applied appropriately? Was USAID adequately informed of training activities and results? Assess local PVO perception of the training.
4. Point out unintended or unanticipated results, good or bad, of subproject activities and assess impact.
5. Review plans for the collection and use of user-fees.

C) Technical Components - Civil and Electrical Engineering:

1. Assess the quality of construction work completed and designs for construction underway in all subprojects including: culvert installation, bridge construction, mini-hydroelectric plant construction, solar equipment installation, and structural rehabilitation of rural health centers. Was the overall quality of the work acceptable? Was the work in conformance with AID standards, including environmental and human safety? Were mechanisms established for the ongoing maintenance of capital investments after project completion?
2. Identify any technical gaps that hindered the attainment of project objectives.
3. Recommend actions to be taken in the event that subproject activities have not been completed as planned in April, 1987.
4. Assess the budget and work plan prepared by ORT for overall road maintenance in the farm-to-market roads subproject area.

D) Health Component:

1. Assess the impact of technical training interventions undertaken by the PVO during this subproject.
2. Assess mechanisms established by ORT and the subgrantee for monitoring the end-use of equipment and supplies furnished by the project.

PRM:Gwalker:n1
Document: 7503c
May 9, 1987