

Agency for International Development  PACR Project Assistance Completion Report	1. Cooperating Country Sudan
	2. Project Name & Number Port Sudan Refugee Water Project (650-0050)
3. Functional Account(s)	FDA

4. Project Assistance Completion Date (PACD) Original <u>12/31/82</u> Amended <u>6/30/88</u>	5. PRO/AG No. and Date 650-0050 June 4, 1981 Amended June 23, 1983
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6. Type of Agreement and Grantee: \_\_\_\_\_

Grant       Cooperative Agreement       LSGA       Other

7. Financial Inputs      \*AID/Sudan controlled \$2.0 million      CARE: \$66,000  
AID/Washington controlled \$0.5 million      UNHCR: \$1.0 million

Project Element		PP Budget	Latest Budget	Earmarked	Unearmarked
#1 Technical Assistance	Dollars	626,000	833,817	833,817	
	LS				
#2 Commodities	Dollars	755,000	2,170,183	2,164,808	5,375
	LS				
#3 Contingencies	Dollars	520,000			
	LS				
#4 Construction	Dollars	1,165,000	562,000	562,000	
	LS		268,932	268,932	
#5 Maintenance	Dollars				
	LS		150,000	150,000	
#6	Dollars				
	LS				
#7	Dollars				
	LS				
Totals	Dollars	3,066,000	3,566,000	3,560,625	5,375
	LS		418,932	418,932	

Local Currency:	CIP (GOS administered)	2,600,000	2,600,000
	Trust Fund (AID administered)	418,932	418,932

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### 8. Outputs

<u>Expected Outputs</u>	<u>Actual Outputs</u>
1. Construction of two filter beds (100M x 25M) which were filled with specified graded materials (slow sand filter).	COMPLETED
2. Provision and installation of pipelines and control system.	COMPLETED
3. Provision and construction of water reservoirs (2 x 2500 M <sup>3</sup> )	COMPLETED
4. Provision of pumping, auxilliary electric power units, and construction of pump house.	COMPLETED
5. Provision and construction of water service distribution lines in the refugee village.	COMPLETED
6. Efficient and simple water system, improved water supply in quantity and quality for the refugees and the city. System has provided an average of 15,000M <sup>3</sup> /day for Port Sudan and refugees; 10,000 refugees were moved to Asotriba.	VERIFIED

### 9. Remaining Actions

- a. Monitoring  
Not Required
- b. Covenants and Conditions  
Expired, conditions are met.
- c. Audit Recommendations  
No audit was performed
- d. Status of Final Evaluation  
No Final evaluation
- e. Estimated Deobligation Amount: \$ 5,375
- f. Terminal Date for Disbursement: March 31, 1989

10. Close Out Check-List

- X   a. The Project Officer, in conjunction with the Controller and Contracting Officer, has reviewed all AID-financed commitments (contracts, sub-grants, PIO/Ts) to ascertain what, if any, amounts remain to be billed and paid; to discover any disputes that have arisen or are likely to arise and to expedite their settlement to the extent possible. An accrual worksheet has been filled in with the help of the Controllers office and all amounts committed but no longer required have been de-committed.
- X   b. The Project Officer, in conjunction with the Controller and Contracting Officer, has reviewed all earmarking documents to ascertain whether all disbursements can be made under existing earmarking documents and, where necessary, to make appropriate adjustments to ensure that sufficient funds will be available to cover all anticipated disbursements. All earmarked funds in excess of those required to complete the project's activities have been de-earmarked.
- X   c. Official project files have been cleaned up and organized, those no longer required for implementation and monitoring have been retired to storage.

11. Other Comments

The project was substantially completed in 1984 by CARE. A start-up operation program was conducted in 1984/85. Technical defects due to design and construction faults were identified. A Remedial Plan to correct the defects was successfully executed in 1987/88 by NUWC and AID. Currently the system is operational and potable water is provided for the refugees and for Port Sudan.

12. Clearances			
Project Officer	Date	Program Officer	Date
JFranckiewicz, ENG <i>JF</i>	10/29/89	BJensen, EPP <i>BJ</i>	10/31/89
Contracts Officer	Date	Controller <i>RHammersley</i>	Date
DOSinski, CO <i>DOSinski</i>	10/29/89	RHammersley, CONT <i>RHammersley</i>	11/2/89
LKeays, PO <i>LK</i>	10/30/89		

13. Authorized	
Name	Date
Frederick E. Gilbert <i>F. Gilbert</i>	11/6/89
Mission Director	

PORT SUDAN WATER SUPPLY PROJECT  
650-0050  
PROJECT ASSISTANCE COMPLETION REPORT

1. Project Description

The project purpose was to provide a potable water supply for refugee residents in the Port Sudan area. The water system has a design capacity of 25,000 M<sup>3</sup> per day. This volume of water serves the refugee camp southwest of Port Sudan which has a population of 100,000 inhabitants. This water also supplements the existing water supply in Port Sudan.

The Project Grant Agreement was signed June 4, 1981, with the Government of Sudan. Under that agreement, AID signed a Cooperative Agreement with CARE under which CARE was to supervise construction activities and act as a procurement agent for materials and equipment. Construction activities were organized in two phases. Phase one involved the construction of a slow sand filter system on Khor Arbaat, the project water source. Phase two involved the construction of storage, transmission, and distribution systems in the refugee camp. These works are supplied with water through a pumping plant which is connected to the existing city system.

In June of 1983, during construction of Phase I, a flood damaged the slow-sand filter and the protective dike. James M. Montgomery Consulting Engineers (JMM) was asked by AID to review the project design. JMM subsequently modified the construction dike design and specified some technical recommendations for the filter media. Both phases were completed by CARE in 1984. CARE issued a certificate of completion to the construction contractor in August of 1984.

Operation start-up tests several weeks later revealed technical defects in both design and construction. JMM was hired to re-design and improve the system as Phase III of the project. JMM also provided construction supervision during the initial stage of the remedial work. A local contractor was selected by NUWC for Phase III.

Remedial Plan - The Remedial construction was supervised by NUWC and it was completed prior to the PACD of June 30, 1988. The water system was operational on June 30, 1988, the PACD.

2. Project Status

On June 30, 1988, all the project activities were completed. All project systems are in operation.

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**A. Construction:**

The project works, which were constructed and operational by the P.A.C.D., include the following:

- (1) Two slow sand filter beds of 25m x 100m area.
- (2) Two 2,500 M<sup>3</sup> water reservoirs.
- (3) A pump station with auxillary power.
- (4) A pipeline and control system.
- (5) Water service distribution line and public stand pipes in the refugee camp.

**B. Procurement:**

All the project commodities were procured by CARE in Phase I and II.

**C. Training:**

No training was provided under this project.

**D. Technical Assistance:**

Original system design was prepared by Sheladia Associates, Inc. JMM re-designed the protection dike and the filter media. JMM also provided construction supervision during the initial stage of Phase III construction.

**Project Accomplishments**

Floods damaged the partially completed slow-sand filters and delayed the project in 1983. Design and construction defects in the water system were discovered after several weeks of operation in 1985. A remedial plan was instituted by AID in 1986. The remedial work on the project was instituted efficiently. The water system was rehabilitated, and currently all the project systems operate as originally planned.

The project has accomplished the initially planned outputs as specified in the PP logframe. The slow sand filter with a 25,000m<sup>3</sup> capacity is in operation. A storage tank and a distribution system with approximately 30 standpipes were installed at the UN funded refugee camp southwest of Port Sudan (Asotriba). If adequate surface flows are present at the slow sand filter, then an additional 14,000m<sup>3</sup>/day of water is available for the municipal system in Port Sudan.

Because of political problems between Port Sudan residents and refugees, only the first stage of construction at Asotriba was completed. The first stage was for approximately one third of the total planned residences. The project purpose was achieved since adequate water was available for the refugee housing area.

#### Donor Contributions/Activities

AID signed a Cooperative Agreement with CARE for Phase I and II. CARE supervised construction activities and acted as a procurement agent for materials and equipment required for construction. GOS personnel participated in all phases. The Commissioner of Refugees was involved in Phase I and II and the National Urban Water Corporation (PEWC) was involved in Phase III. UNHCR covered all system design costs with an obligation of one million dollars.

#### Lessons Learned

- (A) Phase I and II were implemented under the GOS Commissioner of Refugees. This situation created numerous project difficulties. When the proper agency, NUWC, was involved with the water project during Phase III, implementation and operation of the project proceeded smoothly.
- (B) Completed projects with design and/or construction problems can be salvaged and corrected with relatively low additional project costs. However, AID and NUWC were significantly involved in Phase III, which is not reflected in the budget figures.
- (C) Slow-sand filtration for water treatment is a simple process viable for application in municipal water supply projects. These systems can be built, operated and maintained by communities in Sudan.