

OFFICE OF THE
DIRECTOR FOR INTERNATIONAL OPERATIONS
WASHINGTON, D.C. 20523

PROJECT PAPER

Proposal and Recommendations
For the Review of the
Bilateral Assistance Subcommittee

SUDAN - NORTHERN SUDAN PRIMARY HEALTH CARE (PHASE I)

AID/BAS-019

UNCLASSIFIED

DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

UNCLASSIFIED

AID/BAS-019

July 14, 1978

MEMORANDUM FOR THE BILATERAL ASSISTANCE SUBCOMMITTEE

SUBJECT: Sudan - Northern Sudan Primary Health Care (Phase I)

Attached for your review are recommendations for authorization of a grant to the Government of Sudan of not to exceed Five Million Eight Hundred Sixty-Three Thousand United States Dollars (\$5,863,000) to accelerate, expand and strengthen the ability of the Government of Sudan to deliver primary health care services to the rural areas of the Sudan.

No meeting is scheduled for this grant proposal. However, please advise us of your concurrence or objections as early as possible, but in no event later than close of business on Monday, July 24, 1978. If you are a voting member, a poll sheet has been enclosed for your response.

Working Group on Bilateral Assistance
Office of Policy Development and Program
Review

Attachments:

Summary and Recommendations
Project Analyses
Annexes A - H

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AGENCY FOR INTERNATIONAL DEVELOPMENT PROJECT PAPER FACESHEET		1. TRANSACTION CODE <div style="border: 1px solid black; display: inline-block; padding: 2px;">A</div> A. ADD C. CHANGE D. DELETE		PP 2. DOCUMENT CODE 3
3. COUNTRY ENTITY SUDAN		4. DOCUMENT REVISION NUMBER Original 		
5. PROJECT NUMBER (7 digits) <div style="border: 1px solid black; padding: 2px;">650-0011</div>	6. BUREAU OFFICE A. SYMBOL AFR B. CODE <div style="border: 1px solid black; display: inline-block; padding: 2px;">06</div>	7. PROJECT TITLE (Maximum 40 characters) No. Sudan Primary Health Care (Phase I)		
8. ESTIMATED FY OF PROJECT COMPLETION FY <div style="border: 1px solid black; display: inline-block; padding: 2px;">81</div>		9. ESTIMATED DATE OF OBLIGATION A. INITIAL FY <div style="border: 1px solid black; display: inline-block; padding: 2px;">78</div> B. QUARTER <div style="border: 1px solid black; display: inline-block; padding: 2px;">2</div> C. FINAL FY <div style="border: 1px solid black; display: inline-block; padding: 2px;">80</div> (Enter 1, 2, 3, or 4)		

10. ESTIMATED COSTS (\$000 OR EQUIVALENT \$) -						
A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FX	C. L/C	D. TOTAL	E. FX	F. L/C	G. TOTAL
AID APPROPRIATED TOTAL	(1,601)	(341)	(1,942)	(5,208)	(656)	(5,863)
(GRANT)						
(LOAN)						
OTHER U.S.						
1.						
2.						
HOST COUNTRY	89	7,481	7,570	1,562	21,023	22,585
OTHER DONOR(S)						
TOTALS	1,690	7,822	9,512	6,770	21,679	28,448

11. PROPOSED BUDGET APPROPRIATED FUNDS (\$000)									
A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. 1ST FY <u>78</u>		H. 2ND FY <u>79</u>		K. 3RD FY <u>80</u>	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1) PH	530-B	510		1,942		2,752		1,169	
(2)									
(3)									
(4)									
TOTALS				1,942		2,752		1,169	

A. APPROPRIATION	N. 4TH FY		O. 5TH FY		LIFE OF PROJECT		12. IN-DEPTH EVALUATION SCHEDULED
	P. GRANT	Q. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN	
(1) PH					5,863		<div style="border: 1px solid black; display: inline-block; padding: 5px;"> MM YY 10 80 </div>
(2)							
(3)							
(4)							
TOTALS					5,863		

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PID FACESHEET DATA, BLOCKS 12, 13, 14, OR 15 OR IN PID FACESHEET DATA, BLOCK 12? IF YES, ATTACH CHANGED PID FACESHEET.

1
 1. NO
 2. YES

14. ORIGINATING OFFICE CLEARANCE		15. DATE DOCUMENT RECEIVED IN AID W. OR FOR AID W. DOCUMENTS, DATE OF DISTRIBUTION MM DD YY <div style="border: 1px solid black; display: inline-block; padding: 2px;">01 26 78</div>
SIGNATURE		
TITLE AID Representative		
DATE SIGNED		

PROJECT PAPER

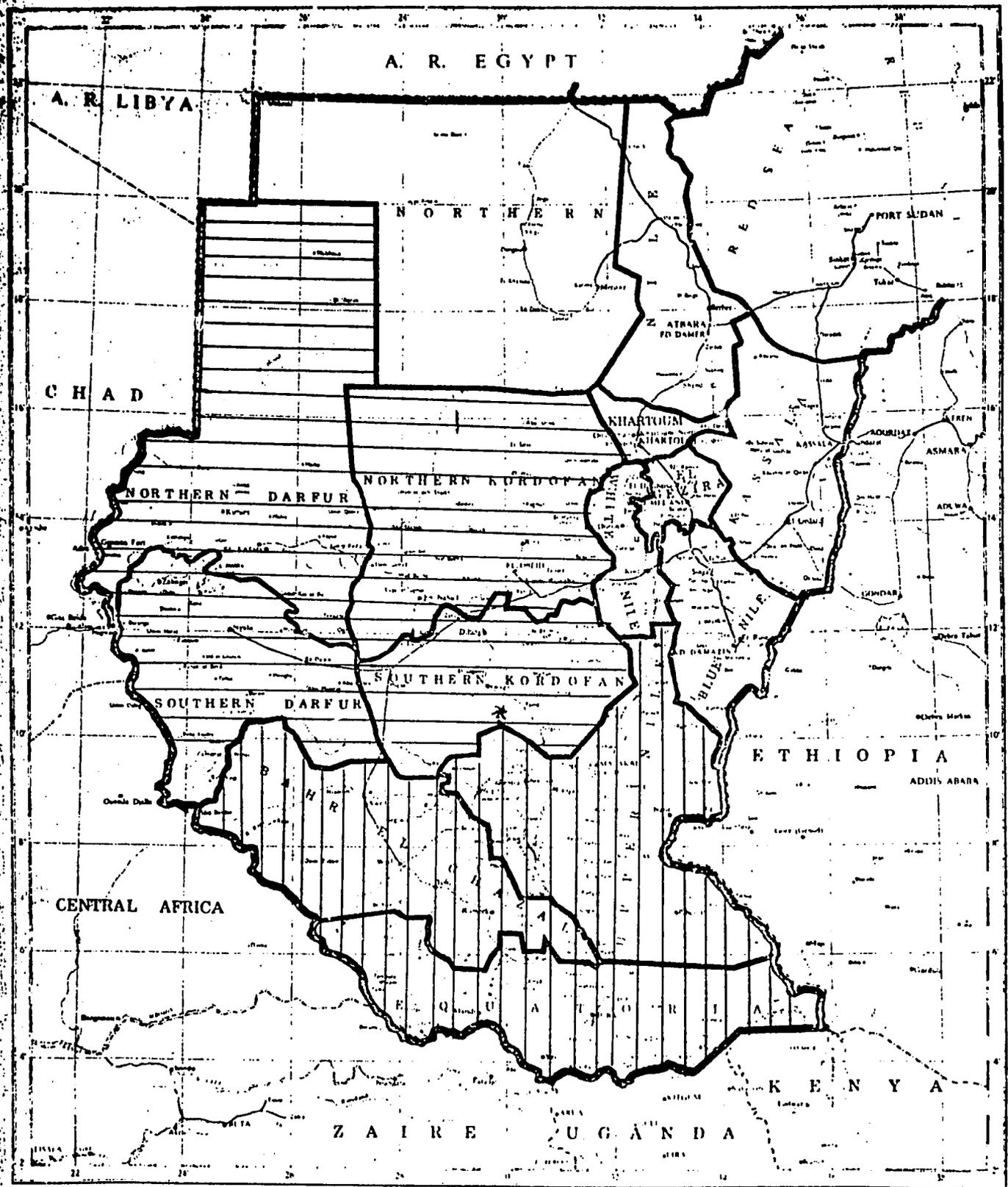
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ABBREVIATIONS

AMRF	African Medical and Research Foundation
CHW	Community Health Worker
DRS	Democratic Republic of Sudan
FY	Fiscal Year
GDP	Gross Domestic Product
GNP	Gross National Product
GOS	Government of Sudan
IRR	Internal Rate of Return
MOH	Ministry of Health
MOH-N	Ministry of Health - Northern Region
MOH-S	Ministry of Health - Southern Region
NCHW	Nomad Community Health Worker
NPV	Net Present Value
PHCC	Primary Health Care Complex
PHCP	Primary Health Care Program
PHCU	Primary Health Care Unit
WHO	World Health Organization

SUDAN



Scale 1:500,000

Legend:

-  N. Sudan PHC Project
-  AMRF Project
-  HIID Project

Other symbols include a thick black line for international boundaries and a thin black line for administrative boundaries.

PROJECT DESIGN TEAM

HEALTH PLANNER: George Contis, M.D., M.P.H.,
Medical Service Consultants, Inc.

FINANCIAL ANALYST: Catherine Fort, M.A.,
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PROJECT DESIGN OFFICER: Thomas Lofgren, REDSO/Nairobi

ENGINEER: Lewis E. Swanson, REDSO/Nairobi

B. Recommendations

Authorization of a grant of \$5,863,201.

C. Description of the Project

The long-range goal of the GOS is to develop a health care system which will deliver curative, promotive and preventive care to the people of Sudan. To this end, and with the assistance of the WHO, the GOS has systematically analyzed its health problems, prioritized its health needs and prepared a comprehensive national health plan.

The most important element in the GOS's health plan is the Primary Health Care Program (PHCP). This is a comprehensive health delivery system which is community based, is specifically designed to reach the rural poor and the nomads, and relies on community participation.

There are four key components to the PHCP:

- Community Health Workers (CHW) and Nomad Community Health Workers (NCHW), who will provide simple curative and preventive services, and participate in promotive health programs;
- Primary Health Care Units, which are small health facilities serving a population of 4,000 persons, and are manned by the CHWs;
- a logistics/supply system which will provide equipment, drugs and supplies to the CHWs, NCHWs and PHCUs;
- a health and management information system which will collect data on the health problems, services delivered, and supplies utilized at the PHCU.

While the PHCP is a national program, the project described in this PP will focus primarily on the development and implementation of the program in the Northern Region of Sudan, and particularly on its four poorest provinces. A separate project to support the PHCP in the Southern Region through the African Medical Research Foundation (AMRF) is currently under review by AID/W.

Since the inception of the PHCP in the Northern Region in February 1976, a number of significant activities have been accomplished. 60 CHW tutors have been trained, 420 CHWs and NCHWs have been graduated and placed, and

over 425 PHCUs have been built. In addition, baseline studies have been conducted and a health data and management information system has been developed, pretested and modified for use in the PHCP.

Continued expansion of the PHCP in the North is hampered by several constraints:

- limited capability to provide training, orientation and refresher courses for PHCP personnel including CHWs, NCHWs, and supervisory health personnel;
- inadequate financial resources to purchase equipment, supplies, drugs and vehicles that require foreign exchange;
- limited materials and domestic currency to assist communities and provinces to build PHCU and dispensaries;
- inadequate logistics capability to keep the CHWs and PHCUs supplied;
- insufficient resources to implement the health data and management information system.

The AID project described in this PP seeks to assist the GOS to eliminate these constraints and to permit the PHCP to expand more rapidly in Northern Sudan.

The proposed project will provide the following inputs over a three year period:

- 9 person years of long term technical assistance (a community health physician, a vital statistics expert, and a logistic/supply specialist);
- 32 person months of short term technical assistance in a variety of health categories related to the PHCP;
- 180 person months of short and long term participant training in the U.S. and third countries;
- support for 131 orientation and refresher training for CHWs, NCHWs and their supervisors;
- \$2.2 million in commodity assistance for such PHCU requirements as equipment, drugs, supplies and vehicles for the logistics/supply system and for supervisory personnel at the central and provincial level;
- \$949,890 for construction of 35 PHCUs.

The proposed program will be implemented by a contractor who will work under the day-to-day supervision of the Director General of Rural Health and Provincial Affairs, MOH. USAID/Khartoum will monitor the project through a project officer who will also have a similar role for the AMRF project in the Southern Region. This approach will serve to coordinate the two AID health sector support projects.

The success of this project will depend on several factors:

- the ability of the MOH to provide counterpart technicians, appropriate personnel for training, financing, and other counterpart inputs;
- the capability of the MOH to systematically integrate the various outputs of the project -- CHWs, PHCUs, a logistics/supply system and a health data and management system;
- the ability of the GOS to perform periodic follow-up evaluations in those areas where baseline studies have already been conducted, to enable the GOS to redirect the program as problems are identified.

At the end of the three years of this project, it is anticipated that Sudan will have made significant progress in implementing its PHCP for the rural and nomad poor in the North. The success of the project will be measured in terms of operational capability of the PHCP (i.e., statistics such as PHCUs built and operating, and patients treated). In addition, successful achievement of goals will be identified through evaluation of the functions of related PHCP systems (i.e. the logistics/supply and health data management systems).

D. Summary Findings

The technical, financial, social and economic analyses in Part 3 substantiate the soundness of this project in terms of its relevance to the GOS's health goals and resources, and AID's development priorities. The project:

- focuses on the health needs of the rural and nomad poor, who have the least accessibility to health care.
- seeks to address critical technical assistance, training, commodity, and construction constraints to the rapid expansion of the GOS's Primary Health Care Program in the Northern Region.
- is designed to coordinate closely with a similar AID supported project in the Southern Region.
- is cost effective.
- will not excessively strain the GOS's ability to underwrite recurrent costs.

The proposed project is based upon on-going work in the Sudan which is demonstrating the need for, and feasibility of, a primary health care program. Given the MOH's accomplishments to date in this effort, and the resources already committed by the GOS, this project is most timely and appropriate.

The project meets all applicable statutory criteria which have been noted in the completed checklist under Appendix E and F.

The Mission Director's 611(a) certification that Sudan has the capability to effectively maintain and utilize this project is provided in Appendix G.

E. Project Issues

Issues to be considered in implementing this project include:

1. The GOS Ability to Underwrite Recurring Costs

This issue is discussed at length in Part 3 - B.

2. The Expected Contribution of Community Self-Help to the PHCP

This issue is discussed in Part 2-A.

3. Coordination of USAID/Khartoum Health Sector Support Projects for the North and South

This issue is addressed in Part 4-A.

4. Construction

A number of issues related to construction of PHCUs and dispensaries such as the availability of construction materials, adequacy of facility specification, and AID construction regulations are discussed in Part 4-A.

5. Adequacy of GOS Logistics/Supply/Maintenance Capability

This issue is discussed in Part 4-A.

II. PROJECT BACKGROUND AND DETAILED DESCRIPTION

A. Background

1. GOS Health Problems, Policies and Priorities

The Government of Sudan (GOS) recognizes that its national health related problems are, in priority order:

- Malaria - "nation wide"
- Malaria - "man-made"
- Wider coverage by primary care
- Bilharzia - "man-made"
- Public's lack of health information and lack of hygienic habits
- Communicable diseases, especially those preventible by immunization
- Need for safe and adequate water supplies
- Environmental sanitation (refuse and human excreta disposal)
- Protein-calorie malnutrition
- Gastro-enteritis (children, adults)
- Tuberculosis

To deal with these problems, the GOS, with assistance from the World Health Organization (WHO), developed a comprehensive plan -- The National Health Programme. This plan is one of the most thorough and detailed health plans that has been prepared for any developing country. It describes five health policy priorities:

1. Preventive and Social Medicine are the top priority, especially the control or eradication of endemic and epidemic diseases and improvement of environmental health conditions. Special attention is to be given to maternal and child health and school health services.
2. Rural health care facilities are to be strengthened to ensure complete coverage and fair distribution to the entire population with basic health care services.
3. Training facilities are to be provided for all levels of professional, technical and auxiliary manpower.

4. Existing curative health facilities are to be consolidated to provide better services for the population. Some expansion in curative health care facilities will be allowed in the less developed areas of the country.

5. Medical research is to be directed towards health problems according to their priorities.

National Health Programme

The National Health Programme was published in 1975. It prioritized eight programs to address the major health problems of Sudan. These are:

- Malaria - Nationwide
- Malaria - Man-made
- Primary Health Care
- Control of Bilharzia in Irrigated Areas
- Safe Water Supply
- Environmental Health
- Food (Dura) Supply in Certain Areas
- Onchocerciasis Control

Among the eight programs, the Primary Health Care Program (PHCP) is the major component. As will be discussed below, the PHCP combines many aspects of the other seven programs. It is through the PHCP that the GOS will seek to achieve its objective of significantly expanding basic health care services to the people of Sudan, approximately 71% of whom live in rural areas and 11% are nomads.

3. Primary Health Care Program

Because of the PHCP's special relevance to the overall development goals of the GOS and of AID, the focus of USAID/Khartoum's health sector support will be on the PHCP. As defined by the GOS, the PHCP is a comprehensive health delivery system which:

- is community based and reaches beyond the health center and dispensary,
- is specifically designed to have responsibility for the entire rural and nomadic population,
- lays stress on health services that are promotive and preventive rather than curative,
- includes rural development activities, and
- relies on community participation and self reliance in the development of a rural health care system at the peripheral level.

The specific services which the PHCP will seek to deliver are:

- Provision of public health care services
- Health education to increase public awareness of health and improve hygiene
- Immunization to prevent communicable diseases
- Nutrition activities to prevent and treat protein-calorie malnutrition
- Provision of services to deal with gastroenteritis
- Provision of services to detect and treat tuberculosis
- Provision of services to detect and treat sleeping sickness
- Provision of services to detect and treat kala-azar

The implementation of the PHCP will largely depend on a new type of health personnel -- the Community Health Worker (CHW). This person will be selected by the community, the local government, and the Ministry of Health from among persons with primary school education. The CHW will receive six months of training and then be assigned to a Primary Health Care Unit (PHCU).

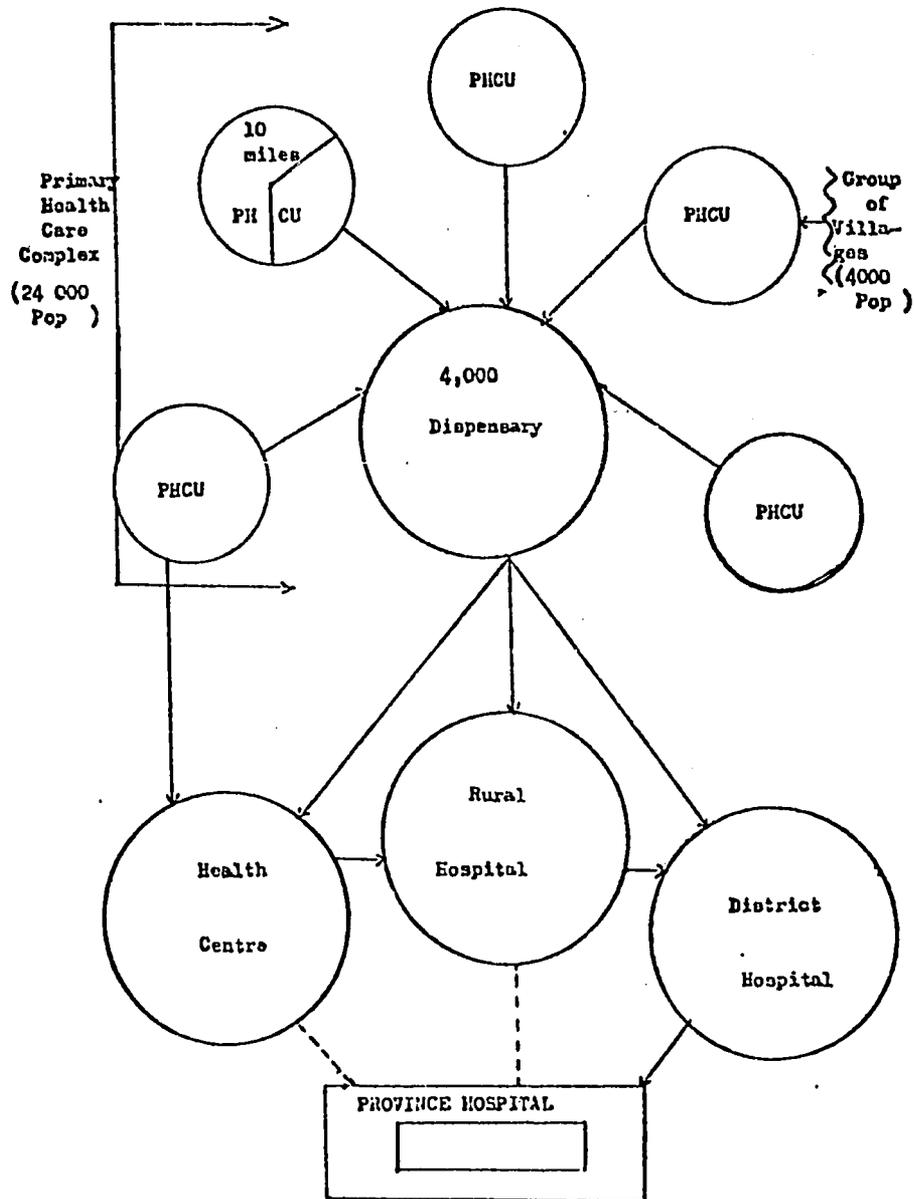
The Primary Health Care Unit will be a simple health facility built to serve approximately four thousand persons living within a radius of 10 miles. The PHCU will be the most peripheral facility in the health delivery system. Five such units and their CHWs will be supervised by a Medical Assistant in a dispensary. The dispensary and its five PHCUs are called a Primary Health Care Complex (PHCC) and will serve 24,000 persons (see Chart II-1).

An important aspect of the PHCP is the attention that Sudan is paying to the health needs of its nomads. Because of the sizable nomadic population in the Eastern and Western regions, studies were conducted among nomadic tribes in February-April, 1976. On the basis of the results obtained, it was decided that a separate category of CHW will be trained -- the Nomad Community Health Worker (NCHW). This person will deal with the special health problems of nomads, and will have responsibility for 1,500 persons. In keeping with the nomads' life style, the NCHW will not work from a static facility such as a PHCU, but will follow the tribe as it moves from place to place.

The CHWs and the NCHWs will be responsible for:

- promotion of health in the community by improving rural sanitation, instituting village refuse disposal, fostering safe water supplies and better nutrition based on local foods;

CHART II-1: PRIMARY HEALTH CARE COMPLEX



Keys PHC - Primary Health Care Sources: MIP Document page 65
 ———> Normal Referral
 - - -> Emergency Referral

BB. This figure has been further perfected as far as referral from PHCU to Health Centre is concerned.

- stressing preventive medicine through health education and assistance in immunization campaigns; and
- provision of curative care limited to ten or twelve locally important diseases.

The CHWs and the NCHWs will also participate in related activities that will ensure the integration of health into other community development efforts.

As noted previously, 5 PHCUs together with one dispensary will form a PHC Complex (PHCC) serving 24,000 persons. Each dispensary will be staffed by one medical assistant and a nurse. All medical assistants are male nurses with two additional years of training. Three-quarters of the nurses are male.

The Primary Health Care Units will receive supervisory support from the medical assistants in the dispensaries. Further back-up and referral support will be provided by the dispensary as well as from the next higher echelons of care -- the rural health centers and district/rural hospitals.

The health activities of the Primary Health Care Program will be monitored through a simple information system that has already been pretested. This data system will collect information on patients' origin, age, sex and occupation, as well as morbidity and treatment received.

The PHCP with its goal of providing preventive, promotive and curative health services to all areas of the country by 1984 will place a heavy load on the GOS to:

- recruit and train CHWs and NCHWs
- orient and retrain supervisory level personnel, and provide refresher courses for CHWs and NCHWs
- renovate or build dispensaries and PHCUs
- build training facilities for PHCP health personnel.

The following table shows the magnitude of this effort.

TABLE II - 1

Region	No. of CHWs By By 1984	No. of NCHWs By 1984	No. of Dispen- saries By 1984	No. of PHCUs By 1984	No. of Training Centers By 1984
Northern	140	---	28	140	2
Central	900	---	180	900	9
Western	735	598	147	735	14
Eastern	205	239	41	205	5
Southern	708	---	141	708	7
TOTAL	2688	837	537	2688	37

Since the PHC plan was first published, several changes have been made. Among these are:

- the decision by the North not to build any training centers because of the cost and the time delay involved.
- the realization that the number of dispensaries and PHCUs originally projected did not adequately take into account the geographical distribution of the population. The original calculations were based on 1 PHCU per 4,000 population living in an area with a radius of 10 miles. The GOS now realizes that some PCHUs may have to serve far fewer than 4,000 persons who might be living over a much greater area than a radius of 10 miles.

As will be noted later in this section, community self help will play an important role in relieving the GOS of some of the PHCU construction responsibility. Four of the poorer provinces (North and South Darfur, North and South Kordofan) however, do not have the same resource base to support any extensive self-help PHCU construction program. This is evident in recent statistics which show that these four provinces are lagging behind the central provinces in the PHCU construction effort. For these and

other reasons that will be described later in this section, USAID will focus the construction component of this project on the four western provinces.

4. Preliminary USAID Health Project Planning Activities

In October 1976, the GOS sponsored an International Donors Conference to review the Primary Health Care Program plan for 1977-84 and to solicit technical and financial support for its implementation. Represented at this conference were UK-ODM, UNDP, UNICEF, Belgium, France, Holland, Egypt, Saudi Arabia, Federal Republic of Germany, Pakistan and FED. Most of these donors, including AID, expressed interest in, and support of, the PHCP; but did not make specific commitments at the conference. Others either made specific pledges for support of the program or were presently supporting programs which were directly contributing to the PHCP (e. g., Saudi Arabia pledged \$1 million per year; Pakistan pledged \$25,000). The current status of these pledges and subsequent contributions to the PHCP are reviewed in Part III B, Financial Analysis, of this Project Paper.

In reporting on the conference, the AID representative recommended that AID prepare a Health Sector Assessment for Sudan and use that as a basis for possible AID assistance to the PHCP and the National Health Program.

During June 15 to July 15, 1977, an eight member AID team visited the DRS and conducted extensive discussions with Ministry of Health officials in Khartoum and Juba. As a result of those meetings, a Health Sector Assessment Report was prepared, the major findings of which are reviewed briefly below.

A number of recommendations for possible AID assistance to the GOS National Health Program were presented for AID's review by the Health Sector Assessment Team. Subsequent discussions between AID/Washington, USAID/Khartoum, and REDSO/Nairobi resulted in further refinement and definition of the content, scope and magnitude of the project which is described in this PP.

A project design team was sent to Sudan in January 1978 to prepare a Project Paper. The parameters of the project to be designed by this team, as agreed upon between EPCR, AID/Washington, and USAID/Khartoum, included the following:

- the focus of USAID assistance should be on the GOS Primary Health Care Program;
- the USAID project should be bilateral in nature, but should be coordinated with the activities of other donors;
- the project should take into consideration the differing needs, resources and requirements of the North and South regions of Sudan;
- the project should reflect a long term USAID commitment in two phases. Phase I should clearly delineate USAID's involvement over the first three years. Phase II should outline further USAID support activities over an additional three year period and be based upon the results of Phase I efforts.
- the project should relate and be coordinated with other USAID supported health activities in Sudan;
- the areas of USAID support could encompass Technical Assistance, participant training, commodity support and construction;
- assistance to endemic disease control activities could be included only as these are directly related to the Primary Health Care Program. USAID support to more categorical endemic disease programs could be considered but only in the context of a multilateral project.

5. Brief Description of Sudan's Health Sector

This section will briefly summarize the major findings of the Health Sector Assessment Team that visited Sudan in 1977. For a more detailed description of Sudan's health sector, please refer to the report of the team.

a. Demographic Data

Two censuses have been conducted in Sudan, one in 1956 and the other in 1973. As yet, much of the data from the 1973 census has not been collated. Consequently, statistics on population projections, population density, distribution of population by provinces, urban/rural/nomadic distribution, and average household size are estimates derived from preliminary results.

There is a great deal of under reporting of births and deaths in Sudan. In 1971, birth registration varied from 7% in some provinces to 73% in Khartoum. Most of the registered births are in urban areas where deliveries and registration are done by trained midwives.

According to the 1973 Census, Sudan has a population of 14,902,894 of whom approximately 80% live in the North and 20% live in the South. This figure is an estimate based on preliminary 1973 Census results performed by the Department of Statistics in 1975.

Data are available on the estimated age and sex distribution for Sudan, as well as the geographic distribution of the total population by province (see Health Sector Assessment Report). As will be described below, the population in some provinces may be significantly affected by seasonal migration (e. g., Gezira).

With respect to the Southern region, there are several reasons to believe that the actual population may differ markedly from the estimate provided by the census, including:

- at the time of the census, Southerners were still returning from refuge in neighboring countries;
- during civil strife, accurate records were not maintained in the South; and
- technical problems such as illiteracy and inadequate training of some of the interviewers may have resulted in reporting errors.

The MOH Department of Statistics believes that the crude birth rate for 1973 was between 48 to 50 live births per 1,000 population. It estimates that the 1973 crude death rate is between 20 to 25 deaths per 1,000 population.

Using the Department of Statistics figures, the crude rate of natural increase is 2.5%. This rate is utilized for planning purposes by the Ministry of Health. More recent calculations for four Provinces (Khartoum, Kordofan, Kassala and El Gezira) indicate that an even higher crude natural rate of increase may exist (3.2%).

The accuracy of these figures is limited given the fact that they are derived from estimated birth and death rates. Further, external migration has not entered into the estimates, although this factor is small.

The Department of Statistics estimates the infant mortality rate to be between 135 to 145 infant deaths per 1,000 live births for the country as a whole. For Khartoum alone, however, the rate is estimated to be less than 100.

For males, life expectancy at birth is 47.3 years and for females it is 49.9 years (U.N. Demographic Yearbook for 1975). For a child that has survived to the first year of age, life expectancy is 59 years. (Model Life tables from Ansley J. Coale and Paul Demeny's Regional Model Life Tables and Stable Populations).

Data from the two censuses of 1956 and 1973 indicate that an increase in population density from 4.1 to 5.9 persons per square kilometer has occurred during the 17-year period.

These figures, however, include large uninhabited desert areas in the Darfur and Northern Provinces (328,000 square kilometers), and the considerable smaller game reserve area in the Blue Nile (6,000 square kilometers). If these uninhabited regions are excluded from the calculations, the population density was 4.8 and 6.9 persons per square kilometer for the years 1956 and 1973 respectively.

Although the Sudan is, overall, one of the least densely populated countries in the world, the regional variations lead to heavy density in some areas. Approximately 44% of the population lives on 23% of the land (Blue Nile, Kassala and Khartoum Provinces).

The most extensive areas of high density, centering on the confluence of the Nile, extends southeastward to the Ethiopian border and southwestward into the Nuba Mountains, and the farm areas around El Obeid and into the middle of Kordofan Province. The areas of lesser population density are in the swampy (SUDD) region of the south, and the barren desert and arid savanna of the west.

The MOH Department of Statistics has made population projections to the year 1984 for the Northern and Southern regions of Sudan, using a 2.5% crude rate of natural increase. These projections are shown on Table II-2. On the basis of these calculations, it is estimated that Sudan's population will rise from an estimated 16 million in 1977 to almost 19 million by 1984. As noted previously, the 2.5% growth rate may be low.

TABLE II-2

TENTATIVE POPULATION PROJECTIONS IN SUDAN BY REGIONS
AND FOR THE YEARS 1974-1985 IN THOUSANDS

<u>YEAR (1)</u>	<u>NORTH (2)</u>	<u>SOUTH (3)</u>	<u>SUDAN (TOTAL)</u>
1974	12258	2969	15 227
1975	12569	2981	15 550
1976	12888	2994	15 882
1977	13216	3008	16 224
1978	13551	3023	16 574
1979	13895	3040	16 935
1980	14248	3061	17 309
1981	14610	3087	17 697
1982	14981	3120	18 101
1983	15362	3161	18 523
1984	15752	3211	18 963

(1) Fiscal Year starting 1st July

(2) At the rate of 2.5% growth each year. North includes 9 out of the 12 Provinces, The remaining three Provinces are Equatoria, Upper Nile and Bahr el Ghazal. (Since these estimates were calculated in 1975, the Sudan has been redivided into 12 provinces for the North and 6 for the South.)

(3) At the rate of growth not exceeding 0.554 till 1979 and not exceeding 2% till the end of the period 1984.

It is estimated that there are 56 separate ethnic groups in the Sudan. Subdivided in 597 subgroups, these population groupings are often scattered or mixed, making the identification of their precise location difficult. 115 different languages, of which 26 are considered major, are spoken. Arabic is the official language, and is spoken by somewhat more than half of the population. About one-third of the people of Sudan are Arabs. The western and southern regions are dominated by tribal groups of non-Arab descent.

The distribution of the population is shown in Table II-3. It should be noted that this table is based on preliminary 1973 census data.

TABLE II-3

DISTRIBUTION OF THE TOTAL POPULATION
BY PROVINCE IN 1973

<u>Province</u>	<u>Population</u>	<u>%</u>
Khartoum	1,168,169	7.8
Blue Nile	969,474	6.5
White Nile	978,018	6.6
Gezira	1,865,499	12.5
Northern	998,883	6.7
Red Sea	465,043	3.1
Kassala	1,123,387	7.5
Kordofan	2,202,346	14.8
Darfur	2,181,161	14.6
Bahr El Ghazal	1,396,913	9.4
Upper Nile	798,251	5.4
Equatoria	755,750	5.1
TOTAL	14,902,894	100.0

Source: Department of Statistics, 1975. Estimates based on Preliminary 1973 Census results.

With regard to urban, rural and nomadic distribution of population by province, the Population Census Technical Committee of the Department of Statistics uses the following definitions for urban, rural and nomadic population:

Urban - "The urban population includes all towns with a population of 5,000 or more, together with localities of certain administrative and commercial importance."

Rural - "The rural population includes all people leading a settled life throughout the year who do not live in urban areas defined above."

Nomadic - "The nomadic population includes all people who lead a continuous, traditional nomadic life, that is, they have no permanent home and move from place to place living in tents or other temporary housing which they often carry with them. They keep animals and usually move to find grass and water for them."

However, some tribes are semi-nomadic, maintaining a fixed settlement where the old and some of the tribe remain year-round, while the rest migrate with their cattle.

Khartoum Province has the highest urban population (72.8%), Upper Nile Province has the highest rural population (95.3%) and Red Sea Province has the largest nomadic population (35.7%).

In terms of urban-rural differences, approximately 18% of the Sudan's population lives in towns of 5,000 or more persons (1973 census data). This compares to 11% five years earlier in 1968 (U.N. Demographic Yearbook for 1975). Based on U.N. data, approximately 42% of this urban population is concentrated in 4 cities, Khartoum, Khartoum North, Omdurman, and Port Sudan.

Although an accurate count is not available, it is estimated that more than 40% of the Sudan's population is on the move at least part of the year*. 7% of that population is nomadic; the remaining 33% are pastoralists whose movement is dictated by the availability of water and pastures. These populations tend to be most dispersed in the dry season, seeking any available water.

* Nelson, Harold D. ed. Area Handbook for the Democratic Republic of the Sudan. Washington, D.C.: American University Press, 1973

Sudan like many other developed and developing countries is experiencing internal migration from rural to urban areas. The increase in population density of 131% observed in Khartoum Province between 1955 and 1977, and in Blue Nile Province of 84.2% during the same period, is partly due to the high degree of industrialization which took place in these areas.

At the same time, Equatoria and Upper Nile Provinces showed a decrease in population density between 1955 and 1973. While some of this drop can be explained by changing fertility patterns, it is thought that these areas provided the migrants who moved to the more urban provinces.

The fertility pattern varies in different parts of Sudan. It is thought that diseases such as filariasis and gonorrhoea are causes of infertility in some tribes in Upper Nile and Equatoria. A differential fertility rate is also seen among females living in large and small urban areas. Settled populations show a higher mean live birth rate than do nomads (Gezira population 5.19; Baggara nomads 3.8).

A field study of five tribal groups (Henin, 1966) showed that fertility was dependent on a number of factors including:

- age of marriage in settled populations tended to be earlier than the age of marriage among nomads;
- prevalence of marriage varied from 56% in Baggara to 61% in Gezira;
- polygamy was related to a lower fertility rate;
- frequency of divorce was greater among nomads;
- early widowhood was higher among nomads. Divorce and early widowhood was found to be a factor in 0.9% of marriages among Gezira settlers and 3.2% of Baggara nomads;
- prolonged separation was a factor among the nomads where the husband follows the cattle for grazing while his wife or wives remain in another area;
- prolonged lactation for two years and a taboo against sexual intercourse during that time was a factor among Murle nomads;
- medical causes such as malnutrition and ill health were believed to play a role in decreasing fecundity or increased fetal loss.

b. Population Dynamics

Historically, Sudan has been subject to large changes in its population size. Prior to 1870, it was estimated that Sudan had a population of about nine million. Disease, warfare and the slave trade are said to have reduced the population to approximately two million at the turn of this century (Moorehead, 1960). The population gradually increased up to the mid-1960s, at which time internal warfare and out-migration again decreased the population.

Since the Addis Ababa Agreement in 1972, the population has begun to stabilize once more.

Current demographic data on Sudan are far from adequate. Vital statistics registration is low, even in urban areas. The most recent census in 1973 has produced preliminary estimates for many demographic indicators. The methodology and implementation of the census, however, have been criticized so that the results must be interpreted cautiously.

It has also been reported that attempts to verify the findings in specific areas of the country through sample surveys have produced significantly different population indicators than the census reported. Finally, few demographic studies have been done at the regional and district level, thus further limiting the data available for planning and analysis.

Using what data are available, and bearing in mind the limitations of this information, the following appear to be important characteristics related to the population dynamics of the Sudan:

- high birth rate
- high death rate
- high infant mortality rate
- high population growth rate
- high percentage of children below 5 years of age
- relatively low density of population, particularly in the South
- male sex dominance up to the age of 50

Significant regional demographic differences exist in Sudan. This is particularly true between the North and the South. These differences are partly related to geographic, social and economic factors.

Migration is another important population variable in Sudan. This is in the form of:

- rural to urban migration of men from subsistence farms in the west to more industrial cities of the east;
- seasonal migration of tribes which follow their cattle from one grazing area to another;
- seasonal migration of agricultural workers;
- intrarural shifts of tribes dispersed and displaced by the internal strife of the late 1960s now returning to their former lands.

Polygamy is another distinguishing demographic characteristic of Sudan. There is some evidence that this practice has a tendency to produce smaller family units, but there is insufficient data to make any generalizations at this time.

Ethnic composition of the country shows a large number of separate and distinct groups. The customs, manners, taboos, and socio-economic status of these ethnic groups play an important role in determining the demographic variable for each.

c. Political Aspects of Population Dynamics

As in many other countries, population size has vital political implications. In 1973, President Nimeiri announced that Sudan's population was upwards of 20 million. It has been reported that preliminary census results released shortly thereafter indicated that the population was only 13 million. Subsequent revision and analysis of the 1973 census data put the total population at almost 15 million.

The ethnic composition of the country is approximately two-thirds Moslem Arabs living in the North, and one-third Nilotic animistic peoples in the South. This has caused political tensions and sensitivities between these two regions.

The regional distribution of state revenues is partially related to population size. It is not surprising, therefore, that there is dissatisfaction in the South because of presumed under-reporting in the 1973 census.

In addition, there appears to be no clear cut agreement among the development planners and economists in Sudan regarding the relationship between population growth and overall economic development. In some circles, it is felt that Sudan has unlimited agricultural potential and requires manpower for this sector. Others argue that economic development will be hindered by population growth rates that are too high.

As a result of these factors -- regional differences, ethnic composition, distribution of state revenues, and differing interpretations of the relationship between economic development and population growth -- Sudan has no stated population policy. Family Planning services are permitted, but only in the context of maternal and child health, and only as a means for child spacing. Further, with its emphasis on family planning as a vehicle for dealing with problems of infertility in the South, a somewhat pronatalist regional policy is implied.

The UNFPA has identified Sudan as a primary area for its support. As a result, a five or six member team is expected to visit Sudan in February 1978. The team's purpose is to review child spacing activities in the Sudan and to determine which areas of assistance might be provided by UNFPA in the future.

d. Health

From a health standpoint, Sudan suffers from the same problems which affect most developing countries in tropical Africa. These are:

- major endemic diseases and environmental health problems;
- communicable and infectious diseases;
- malnutrition and lack of safe water supply; and
- maternal and child health problems.

A detailed description of the health problems in Sudan, as well as their regional distribution, is contained in Chapter V of the Health Sector Assessment Report.

Additional information is contained in the GOS National Health Programme, the Primary Health Care Programme for Eastern, Northern, Central and Western Regions of the Sudan, and the Primary Health Care Programme Southern Region Sudan.

e. Health Delivery System: Manpower and Facilities

Before the implementation of the Primary Health Care Program, in 1975, rural health services were provided out of:

- 1505 dressing stations
- 634 dispensaries
- 144 health centers
- 171 hospitals.

The majority of these facilities were located in the North.

The dressing stations, located in villages, were staffed by a nurse. His functions consisted primarily of first-aid. These dressing stations are now being upgraded to PHCUs, and these nurses will be replaced by CHWs.

The dispensaries, located in towns, are the next level in the organizational structure of the health delivery system. In the PHCP, they will now assume a new role -- that of supervision of the PHCU and the CHWs. These dispensaries are staffed by medical assistants and nurses.

Health centers, serving two or more dispensaries, are staffed by one or more senior medical assistants, one or more nurses and one health visitor. The latter is a female nurse with one additional year of training.

The highest echelon in the delivery system is the rural or district hospital. This is staffed by one or more medical officers, several medical assistants and nurses.

There are 18 health administrative divisions (provincial), 12 covering the four Northern Regions, under the Ministry of Health, Khartoum; and 6 in the south, coordinated by the Ministry of Health for the Southern Region, Juba.

From an infrastructure standpoint, major problems in the health sector are related to:

- shortage and maldistribution of health manpower and facilities;
- deficiencies in budgetary resources; and
- lower priority placed on health, in relation to the overall development program.

Detailed descriptions of the manpower and facilities resources in Sudan are contained in Chapter IV of the Health Sector Assessment Report.

f. Health Logistics and Supply System

An important element of any health delivery system is its logistics and supply system. A continuing problem in most developing countries, and Sudan is no exception, involves the capability of the MOH to keep its health facilities well supplied.

Important limiting factors to the efficient procurement, storage, distribution and tracking of medical supplies and equipment include:

- availability of trained manpower, especially in the fields of pharmacology and logistics support;
- availability of transportation and vehicle maintenance facilities;
- medical equipment repair capability;
- geographical and seasonal factors such as floods, heavy rains and difficult terrain;
- local production capability for various drugs and pharmaceuticals;
- availability of foreign exchange to purchase drugs, biologicals and equipment that can not be produced within Sudan.

A detailed description of the Sudanese drugs, medical supplies and equipment support services is contained in the Health Sector Assessment Report - Appendix 3.

g. Health Data and Management Information System

A Division of Statistics is located within the MOH. Unlike several of the other bureaus and divisions in the Ministry, the Division of Statistics has data and information collection responsibilities for both the Northern and Southern Regions.

The staff of the Division includes approximately 300 statisticians, demographers and lower level personnel. Each province has a small statistical staff who belong to the Division of Statistics and whose responsibility is to collect data from the districts within the province. This data is forwarded to the Division of Statistics in Khartoum. The analysis of the data is done centrally. Some data analysis is done at the Southern Regional level, but a broader analytic role is precluded by the limited size of the professional statistical staff in Juba. Little or no analysis of data is done at the provincial level.

At present, the health data system generates monthly reports that focus largely on disease incidence, with only limited management information being generated.

With the assistance of WHO, a health information system including a series of data collection instruments have been designed particularly for use in the PHCP. These have been pretested in both the North and the South, and modifications have been made on the basis of the pretest results. The forms have subsequently been restructured and have recently received the approval of the WHO staff in Geneva who participated in the design of the data system.

Because of a shortage of funds, the new forms have not been printed and distributed. This has led to a further complication in the implementation of a unified health data and management information system for the PHCP. The African Medical and Research Foundation (AMRF), which is assisting in the training of CHWs in the South, has introduced significantly different data collection instruments for use in the South. This problem has been brought to the attention of the MOH Division of Statistics and it is anticipated that a single health data and management information system that contains the best elements of the two data instruments will be produced shortly.

6. Accomplishments of the PHCP to Date

The plan for the Primary Health Care Program identified a number of pre-implementation activities that were to begin in the Northern and Southern Regions starting in February 1976.

Tables II-4 and II-5 on the following pages describe the accomplishments that have taken place in the PHCP at the Northern and Southern Regional level as of January 1978.

TABLE II - 4

ACCOMPLISHMENTS OF THE PHCP - NORTHERN REGION

January 1978

PHCP PLAN CODE NO.	ACTIVITY	ACCOMPLISHMENTS
01	Establish an office for the PHCP within the directorate for Rural Health & Provincial Affairs in the Ministry of Health, with branches at the provincial level.	The Director General of Rural Health and Provincial Affairs, MOH is responsible for the PHCP. He is assisted by two full time Medical Officers, a half-time Senior Medical Assistant, and a full time clerk. Two Regional Medical Assistant positions have been created and candidates are being recruited.
02	Map population areas to be served.	Served and unserved areas have been delineated for all of the Northern provinces. Priority areas for program expansion have been created.
03	<p>a. Locate PHCUs and CHW training centres.</p> <p>b. Start construction and renovation of PHCUs.</p>	<p>a. Sites for PHCUs have been selected. In a major departure from the plan, the Northern Region will not build special training centers for CHWs because of the expense and the time delay involved. Instead, other health training facilities are being used (e.g., nursing schools).</p> <p>b. Over 425 PHCUs have been renovated or built,</p>

TABLE II - 4 (continued)

PHCP PLAN CODE NO.	ACTIVITY	ACCOMPLISHMENTS
04	Recruit and train tutors for CHWs, including the requirements for nomadic populations.	The first group of 36 tutors have been selected, trained and placed. Twelve of these will train nomads and 16 24 will train CHWs. A second group of 24 tutors (8 for nomads and 16 for settled areas) are in training and will graduate in June, 1977.
05	Select, recruit and train CHWs including those for nomadic populations.	The first group of 420 CHWS finished their training in September, 1977. 300 CHWs have been assigned to settled areas and 120 to nomad populations. A second group of 700 CHWs (500 for settled areas and 200 for nomads) will finish their training in June, 1978.
06	<p>a. Organize and procure medical kits for PHCUs and dispensaries.</p> <p>b. Set up medical stores for the PHCP at central and provincial levels.</p>	<p>a. Medical kits for PHCUs and dispensaries in 4 provinces have been provided by UNICEF. The remaining provinces have allocated money in their budgets to pay for the medical kits required in their areas.</p> <p>b. Funds have been allocated for one Central and three provincial medical stores.</p>
07	Formulate and test information procedures in selected provinces (Kassala, Northern Darfur, and Northern Kordofan).	A health information system has been developed, pretested in 5 Northern villages, and subsequently has been modified. This system recently received approval from WHO/Geneva.

TABLE II - 4 (continued)

PHCP PLAN CODE NO.	ACTIVITY	ACCOMPLISHMENTS
08	Perform community baseline studies for the PHCP, in Northern Kordofan, Southern Darfur, and Kassala provinces, including selected nomadic communities (clans) as a basis for the evaluation of coverage and further formulation of special strategy for nomads.	Baseline social, economic, demographic and health studies were planned with WHO assistance and performed during October-December 1976 in two villages in Northern Kordofan, and one village in Kassala Province.

TABLE II - 5

ACCOMPLISHMENTS OF THE PHCP - SOUTHERN REGION

January 1978

PHCP PLAN CODE NO.	ACTIVITY	ACCOMPLISHMENTS
01	Establish a department for the PHCP in the Regional Ministry of Health and Social Welfare	A Director has been appointed who has two full time assistants -- a Medical Officer and a Medical Assistant/Tutor. Six PHC Inspector positions, one for each of the six Southern Provinces, have been created and candidates are currently being recruited.
02	Map population areas to be served.	Original plans to rely on aerial mapping techniques to identify population sites had to be abandoned. Instead, survey teams will interview village elders and chiefs during February and March, 1978 to determine the location of population groups to be served by the PHCP.
03	Locate PHCUs and CHW training centres, and start of construction.	<p>a. The exact siting of all the PHCUs will be postponed until population mapping (activity 02) has been completed. Sites for 8 CHW Training Centers have been selected.</p> <p>b. As of December 31, 1977, 13 new PHCUs have been built. An additional unknown number of PHCUs have been built or renovated by private voluntary organizations such as Caritas, the Lutheran World Federation and Across.</p>
		Four CHW Training Centers have been renovated and four additional CHW Training Centers are to be built.

TABLE II - 5 (continued)

PHCP PLAN CODE NO.	ACTIVITY	ACCOMPLISHMENTS
04	Recruit and train tutors (teachers for CHWs).	Ten tutors have been trained and are working in the existing four CHW Training Centers. Ten additional tutor positions are currently being advertized.
05	Select, recruit and train CHWs.	102 CHWs are currently in training of whom approximately 25 will graduate in January, 1978.
06	Organize and procure medical kits for PHCUs and dispensaries.	UNICEF has been requested to supply medical kits for 80 PHCUs.
07	Formulate and test informa- tion procedures.	A health information system has been developed, pretested in two villages, and subsequently has been modified. This system recently received approval from WHO/Geneva.
08	Perform community baseline studies for PHCP.	Baseline social, economic, demographic and health studies were planned with WHO assistance and performed in two villages in Equatoria during September-November, 1976.
09	Conversion of 60 existing dressing stations into PHCUs.	An unknown number of dressing stations have been renovated and upgraded into PHCUs through self- help activities or through private voluntary agency assistance.

7. The Role of Self-Help in the PHCP

A theme reiterated by the MOHs in both the North and South is the importance of self-help at the local level. It is based on the concept that development is indigenous change, desired and directed by the affected people themselves.

Local organization is the key, and the following groups are motivating and mobilizing factors:

- village development committees;
- youth groups;
- women's unions'
- parent-teacher groups.

These are modern associations which are being fostered by the SSU, the Ministry of People's Local Government, the Central Women's Union, and the Ministry of Social Affairs. Ultimate decision rests at the village level, and these groups cut across the traditional system of kinship-based alliance. In other cases, they are the base for action where there was none before (i.e., women's associations and youth groups in northern Sudan).

In a number of areas throughout the country, the self-help concept has been responsible for significant expansion of the PHCP. Once a community has made the decision to erect a PHCU, it seeks the approval of the Assistant Commissioner for Health of the Province. When approval is given, the community can go ahead with the building of the PHCU with local resources (labor, materials, funds) but in keeping with government facility specifications. Where there is a scarcity of building materials or funds, the local, district or provincial government contributes additional resources from a special self-help fund. The equipment and supplies, plus the recurrent costs for the PHCUs are borne by the provincial government with some input from the local governments and the community.

As might be expected, the role of self-help has been more visible in the wealthier communities and in the North. Two important examples of the dedication of communities to this concept are:

- In Gezira Province, the entire number of PHCUs that were scheduled to be built by 1983 were completed by January 1978. Most of these were built through self-help efforts.

- In a small community, 14 kilometers outside of Juba, the villagers threatened to burn down the PHCU they had built unless a CHW or nurse was assigned to staff the facility. A nurse is now stationed there full time.

8. Constraints to Implementation of the PHCP

In designing a project to assist the GOS Primary Health Care Program, discussions with MOH officials in both the North and the South focused on constraints to program implementation. Many of these are described in detail in the Health Sector Assessment Report. One factor which was always conspicuous was the disparity of resources between the North and the South.

Briefly, the important bottlenecks to the expansion of the PHCP, as identified by MOH officials, are:

- limited trained manpower at all levels in the health delivery system;
- need for equipment and supplies, and the foreign exchange to purchase those items which are not produced locally;
- need for an efficient logistics/supply system that can reach the farthest limit of the health delivery system on a regular basis;
- need for an information system that can accurately describe the health problems and personnel activities in the field;
- need for training and PCHU facilities, particularly in the poorer provinces;
- poor communications and transportation which limit access of people to the health system which already exists;
- sporadic or insufficient level of supervision of health personnel;
- absence of refresher training for health personnel at all levels in the system;
- financial constraints and the necessity to fund the PCHP through an unpredictable patchwork of resource mechanisms (e.g., central/regional/provincial governments, foreign donors, voluntary organizations, international agencies).

The overall AID program of support to the PHCP seeks to assist the GOS in dealing with these constraints in a unified, comprehensive and interrelated way. The total USAID/Khartoum effort will involve two district projects, the one described in this PP for the Northern Region, and another project for the Southern Region to be funded through the AMRF.

9. Description of AID Support to PHCP in the Southern Region

Concurrent with the development of this proposed project for the Northern Region, AID/W, REDSO/Nairobi and USAID/Sudan have conducted extensive discussions with the African Medical and Research Foundation (AMRF) of Nairobi, Kenya, to implement a similar project for the Southern Region.

The design team for this project, together with the USAID Representative for Sudan, met in both Khartoum and Juba with officials from AMRF and the MOH-S. The purpose of these meetings was to ensure that the project described in this PP and the AMRF project were compatible in their goal, scope and content. As a result, certain modifications to the AMRF proposal were agreed upon and a revised project request will be submitted to AID/W for concurrent review with this PP.

The AMRF, a private voluntary organization, has been assisting the MOH in the Southern Region for several years. Most recently, they have participated in the training of CHW tutors, in the preparation of training manuals, in some limited renovation of CWT training centers and in other technical assistance efforts to the PHCP.

Briefly, the AMRF proposal will provide the following:

- Long term technical assistance personnel:
 1. Project Coordinator/Medical Training officer
 2. Public health nurse
 3. Public health officer
 4. Self-help building supervisor
 5. Survey officer (social scientist)
 6. Senior supply officer
 7. Administrative secretary
- Participant training of MOH counterparts in African countries or overseas, and support of re-orientation and refresher courses for PHC supervisors and CHWs.
- Commodities such as vehicles for the logistics/supply effort, bicycles for CHWs, equipment and supplies for the PHCUs.
- Construction of two CHW Training Centers and a limited number of dispensaries.

The AMRF project request is for a five year period. The project will be under the control and supervision of the Director of the PHCP of the Southern Region MOH. AID supervision of the project will be through a USAID/Khartoum project officer, with assistance from REDSO/Nairobi as necessary.

Coordination of the AMRF project and the AID support program for the North described in this PP will be:

- through the existing coordinating mechanism of the MOH-N and MOH-S;
- through mutually related activities such as the health data and management information system and the logistics/supply systems;
- through informal liaison between the two project coordinators;
- through the USAID/Khartoum project officer.

B. Detailed Description of AID Support to PHCP in the Northern Region

The project design team in collaboration with Ministry of Health officials responsible for developing and carrying out the PHCP identified AID's inputs to this project using the following guidelines:

- the instructions to the design team by AID/W and USAID/S (see Section II. A. for details),
- the constraints to implementation of the PHCP as identified by central MOH and provincial officials (see Section II. A. 8. for details),
- AID's Congressional guidance to direct its resources to the poorest elements of society.

This section will describe AID's inputs to the project and the rationale for choosing these inputs in terms of the guidelines cited above. Please refer to the detailed Logical Framework Matrix which follows as part of this section for project goal and purpose statements, end of project status, specific outputs and output magnitudes, means of verifying outputs, and important assumptions made by the design team in assessing the conditions necessary to the successful achievement of this project's purpose and goal.

1. Technical Assistance

AID will provide 140 person months of technical assistance over three years to this project. Long-term assistance will constitute 108 months and short-term assistance 32 months. All technical assistance was specifically requested by and fully discussed with MOH personnel.

The long-term community health medical advisor (M.D.) will serve as a counterpart to the Director General for Rural and Provincial Affairs, MOH. Together they will assist overall policy direction of the PHCP. The MOH has requested that this person be considered as a "full working partner" in guiding PHCP development rather than an "advisor" in the traditional sense. The community health advisor, in addition to his/her role in directing the PHCP, will be expected to assist the MOH in coordinating other donor inputs to the overall national health priorities of the GOS. By the end of the second year of the project, the community health advisor in his/her role as team leader will submit a report

to USAID/S which contains 1) an assessment of PHCP progress and the technical assistance team's contribution to the PHCP, 2) recommendations and rationale for possible future AID assistance to the PHCP as well as other national health priorities of the GOS for 1981-84, and 3) a description/assessment of other donor health assistance including possible areas of cooperation between AID and other donors in addressing Sudan's health priorities.

The logistics and supply expert (36 PM) will work in the MOH for the Director General of Supply and Logistics. This advisor will also be expected to be a "working partner" in helping the MOH develop a viable logistics/supply system for the PHCP. Since the contractor providing the technical assistance team will be responsible for order and delivery of all U.S. funded vehicles to this project, the logistics/supply advisor will be responsible for ensuring that delivered vehicles are assigned to both central and provincial offices based on priority needs of the PHCP. The logistics/supply advisor will provide USAID/S a thorough assessment of progress in improving the PHCP logistics/supply system at the end of the second year of the project.

The MOH has requested long-term assignment of a vital statistics expert (36 PM) in order to improve the record to date in obtaining vital statistics in the Sudan. The Director General of Statistics, MOH, will direct this advisor's efforts to develop a national health statistics information system which will utilize the PHCP as a key element in gathering the required data. Improvements in developing reliable vital statistics for the Sudan will be the subject of a report to be submitted to USAID/S at the end of the second year by the vital statistics expert.

The 27 person months of short-term advisory services to the project are being provided to respond to specific needs of the MOH in developing appropriate responses to health program requirements in the PHCP and other areas of national concern including endemic and communicable disease control and information system development (excluding vital statistics).

Funds are also provided in this project for 5 pm of short-term advisors to assist in the mid-project evaluation which will be conducted at the end of the second year -- after the long-term advisors' reports have been submitted to USAID/S. (See Evaluation Plan Section II. C. for further evaluation details.)

2. Training

The training inputs to the project include long-term U.S. participant training (36 PM) and short-term training in the Sudan (refresher/orientation courses), a third country (108 PM), and the U. S. (36 PM).

The three long-term participants will be selected by the MOH for 12 months' training in the U. S. Each participant will be expected to obtain an M.A. or equivalent degree and return to an ongoing position in the MOH. The participants will study in three specific areas -- statistics, public health, and logistics/management -- in order to take over the responsibilities of the three long-term U.S. advisors upon their departure.

The short-term third country training will most likely take place at the Public Health Institute in Cairo which will allow the participants to conduct their study in Arabic; however, other appropriate institutions may be selected by the MOH. This short-term training component will focus on upgrading the public health background of deputy and assistant provincial health commissioners. Training will be offered to 36 deputy/assistant health commissioners (12 each year of the project) for approximately 8 weeks each.

The short-term U.S. training will be offered to selected MOH personnel for up to three months per participant. The project will fund up to four participants each year (12 over life of the project) with final selection of the candidates and courses of study to be decided upon by the MOH, AID-funded project advisors, and USAID/S's project manager after review of the manpower training needs of the MOH and the PHCP.

The in-country training input to be funded by AID consists of two types: reorientation training for supervisory medical personnel in the provinces and refresher courses for community health workers.

The reorientation training is designed to give provincial supervisory health personnel above the CHW level a brief but detailed ten-day course on the PHCP. Course participants will be fully briefed on their role in primary

health care, the capabilities and responsibilities of the CHWs, and the commitment and plans of the GOS PHCP through 1984. Although instructors from national and provincial levels are available to conduct these courses at the present time, funding for subsistence allowances, transportation, and basic supplies have caused the MOH to postpone this training indefinitely. Since training of supervisory health personnel is considered a vital component to the success of the PHCP, AID funding of this training is appropriate. Project plans call for 103 sessions with 40 participants in each session in order to provide one-time training to these key provincial health employees.

Refresher training is also designed to be a one-time training effort that will reach each CHW after he/she has received the nine-month basic CHW training and been in the field for one year. MOH officials see this training course as an opportunity to assist each CHW address the medical problems he/she has had to deal with over the previous year, thereby upgrading both the skills of the CHWs and the services delivered to rural areas. This training program will also allow the MOH to assess the suitability of their nine-month CHW training course and make modifications as necessary. Again, the MOH has the personnel but lacks the funding to conduct CHW refresher training. AID support of this MOH training priority will greatly assist in the future direction and appropriate modification of the PHCP. Over three years 28 ten-day courses will be held with 40 CHWs in each course.

3. Commodities/Supplies

The commodity and supply inputs to the project have been selected and limited to items that will overcome critical bottlenecks that are delaying successful start-up of the Primary Health Care Program in the 12 provinces of the Northern Region. Special emphasis has been given to four of the poorest provinces and the nomadic population in selection of construction and drug/supply inputs.

A series of data forms has recently been developed by the GOS with assistance from WHO for use by CHWs. Although the forms are relatively simple to complete and maintain, they will, over a period of time, provide the MOH with an excellent base upon which to make important

decisions regarding national health programs. For the next year or so the MOH will be unable to obtain the funds required to print and distribute the forms to CHWs in the field. The project design team and the MOH feel that the information provided by these forms is sufficiently important to future program decisions regarding the PHCP and other health programs to include \$150,000 one-time funding to print and distribute the data forms to currently and soon-to-be functioning PHCUs. After the first printing the GOS will cover the recurrent costs of making the forms available to PHCUs.

A photocopy machine has been included as a project input at the request of the MOH to enable the Ministry to duplicate various documents -- primarily compilations and analyses of statistical data -- which will be shared with other GOS government agencies including the Southern Region MOH.

An input of 50 project vehicles will help alleviate a major constraint to the PHCP. Throughout the country the transportation problems are the same: drugs and supplies cannot be delivered to PHCUs because of lack of vehicles; supervisors are unable to get to CHWs they are supposed to assist and monitor without transport; students in the nine-month CHW training course are hampered in their practical field training in rural areas because they have no means to get to these sites. It is probably lack of transportation more than any other constraint that hampers the start up of the PHCP.

To help alleviate this problem the project provides an input of 50 vehicles based on the following formula for each of the 12 Northern provinces:

- one 4-5 ton capacity truck to travel throughout the province delivering medical equipment and supplies to PHCUs and dispensaries;
- one 4-5 ton capacity truck to be converted (at GOS expense) to carry CHW students to rural areas to complete their practical training; this vehicle can do double duty as a supply truck between CHW courses;
- 2 four wheel drive 4-6 passenger vehicles for use by provincial health officials in the conduct of their supervisory health duties.

In addition to the four vehicles supplied to each of the 12 provinces, two vehicles are included for the central MOH.

4. Construction (includes equipment/drug supply to constructed units)

Project inputs described thus far have been for support of the overall PHCP in the Northern Sudan, with vehicle inputs especially aimed at the needs of provincial and rural areas.

The remaining inputs are to be utilized specifically by the four poorest provinces of the Northern Region (North Kordofan, South Kordofan, North Darfur, South Darfur) and the nomadic population. It is these four provinces along with the nomads that have the greatest need and yet the fewest resources to construct PHCUs and obtain equipment and drugs. Because of the disparities in PHCU progress between the eastern, northeastern, and central areas of Northern Sudan on the one hand and the western area of Northern Sudan (No. and So. Kordofan, No. and So. Darfur) on the other, the project's inputs of drug and equipment supplies are targeted for the western region and the nomads. The project's construction element is confined to the four provinces of the western area.

The following figures evidence the disparities in PHCU construction progress since PHCP inception in early 1976:

- Of the 12 provinces in Northern Sudan, three (Khartoum, Nile, Northern) have sufficient facilities to require no further construction or renovation under the PHCP.
- Of the 5 non-western provinces requiring construction of PHCUs, approximately 358 PHCUs were constructed -- either entirely through self help or with government assistance -- within 20 months after inception of the PHCP.
- During the same 20-month period, the four western provinces managed to construct only 66 PHCUs

With the construction of the 66 PHCUs since the program began, the four western provinces have an existing stock of 287 PHCUs. By 1980/81 (the end of Phase I of this project) PHCP plans call for 233 additional PHCUs to be built, bringing the total for the western provinces to 520. At a cost of approximately

\$20,000 per PHCU, it is beyond the scope of this project to make much more than a marginal contribution to the overall PHCU construction program. Nevertheless, it is important to the PHCP that initial construction efforts get underway in these four provinces. To that end AID construction inputs of 35 PHCUs are planned as an essential component of the project (For 611(a) certification see Appendix G.)

To ensure that the PHCUs constructed with AID funds begin operation as soon as possible after completion, initial supplies of equipment and drugs will be provided by AID on a one-time, start-up basis. Recurrent costs for future supplies will be met from GOS funds. The project also provides for a one-time initial supply of equipment and drugs to 600 nomad CHWs to cover the early assignment period when the GOS has the most difficulty in making these supplies available.

5. GOS Inputs

All GOS inputs directly associated with this project are recurrent costs of salaries for personnel trained with AID funds; vehicle maintenance, fuel and driver salaries associated with AID-supplied vehicles; and recurrent equipment and drug supplies for AID-constructed PHCUs. (For analysis of GOS inputs and ability to fund, see the Financial Analysis section of this project paper.)

The Logical Framework Matrix which follows displays the relationships between: 1) the project inputs described in the previous pages, 2) the project outputs and magnitudes, 3) the project purpose and end of project status, and 4) the assumptions considered necessary to achieve both project purpose and goal.

BUDGET FY 78 - 80

AID	FY 78		FY 79		FY 80		Total	
	FX	LC	FX	LC	FX	LC	FX	LC
<u>Technical Assistance</u>								
<u>Long Term</u>								
1 MD Community Medical Advisor @ \$47,500 x 3 years (36 PM)	146,254		146,254		146,254		438,763	
1 Vital Statistics Expert @ \$28,000 x 3 years (36 PM)	109,146		109,146		109,146		327,438	
1 Logistics/Supply Expert @ \$28,000 x 3 years (36 PM)	109,146		109,146		109,146		327,438	
<u>Short Term</u>								
3 Advisors per year x 3 mo. @ \$10,000 per mo. (27 PM)	30,000		240,000				270,000	
3 Evaluation Advisors x 1.5 mos. x \$10,000 per month (5 mo.)			50,000				50,000	
<u>Training</u>								
Reorientation courses 103 courses at 3500/course	140,000		140,000		80,000		360,000	
Refresher courses 28 courses at 2000/course	20,000		20,000		16,000		56,000	
Third Country Short term 36 participants - 3 mo. each @ \$5500	66,000		66,000		66,000		198,000	

BUDGET FY 78 - 80 (continued)

AID	FY 78		FY 79		FY 80		Total	
	FX	LC	FX	LC	FX	LC	FX	LC
<u>Training (continued)</u>								
U.S. Long Term Participant Training 3 participants 1 yr ea. @ \$15,200			45,600				45,600	
U.S. Short Term Participant Training 12 participants 3 mos. ea. @ \$8,300			49,800		49,800		99,600	
<u>Commodities/Supplies</u>								
Printing		150,000						150,000
Photocopy Machine	3,000						3,000	
Data Survey				30,000				30,000
24 5 Ton Transport trucks @36,000 CIF Port Sudan +30% spare parts + 10% inflation=51480 ea.	617,760		617,760				1,235,520	
26 4 Wheel drive vehicles @10,000 ea CIF Port Sudan +30% spare parts + 10% inflation = 14,300	185,900		185,900				371,800	
Equipment & Instruments for 35 PHCUs and 600 Nomad CHWs	86,2							
Drugs & Supplies (2 mo. supply) for 35 PHCUs and 600 Nomad CHWs	86,240		54,568		58,113		198,921	
	102,080		53,687		62,530		218,297	

BUDGET FY 78 - 80 (continued)

AID	FY 78		FY 79		FY 80		Total	
	FX	LC	FX	LC	FX	LC	FX	LC
<u>Construction</u>								
<u>35 PHCUs @ \$21,165</u>								
23 @ \$21,165 + 20% inflation for 1 yr. = \$25,398 ea.			584,154				584,154	
12 @ \$21,165 + 20% inflation for 2 yrs. = \$30,478 ea.					365,736		365,736	
Sub Total	1,455,526	310,000	2,312,015	190,000	966,725	96,000	4,734,267	596,000
10% Contingency	145,552	31,000	231,201	19,000	96,672	9,600	473,426	59,600
Total	1,601,078	341,000	2,543,216	209,000	1,063,397	105,600	5,207,693	655,600
TOTAL FX + LC	1,942,078		2,752,216		1,168,997		5,863,201	

Project Title: No. Sudan Primary Health Care
(Phase I) 650-004

LIFE OF PROJECT
From FY 1978 to FY 1980
Total U.S. Funding \$5,863,201
Date Prepared: January 1978

NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

PROGRAM OR SECTOR GOAL: THE BROADER OBJECTIVE

TO WHICH THIS PROJECT CONTRIBUTES:

Through a medium of eight National Health Programs, reduce the incidence of the most virulent diseases and other disabilities that are detrimental to the overall development of the Sudanese,

MEASURES OF GOAL ACHIEVEMENT:

(Indicators for each of the eight national programs)

1. Malaria Nationwide: Morbidity - as measured by the percentage of the population reporting to health facilities and diagnosed to have clinical malaria.
2. Malaria Man Made: Morbidity - the proportion of the population in irrigated areas reported suffering from clinical malaria each year.
3. Primary Health Care Services: Achievement of maximum coverage of primary health services throughout country within framework of current national health plan. This translates to at least one community health worker (CHW) per 4,000 population in settled areas and one per 1,500 population for those living under nomadic conditions.
4. Bilharzia in Irrigated Areas: The incidence of new infections appearing each year in children, prevalence of diarrhea with blood, and snail population density.
5. Safe Water Supplies: Number of water-source facilities improved to prevent human and/or animal contamination; 900 government-owned shallow wells, 30,000 privately-owned shallow wells, 850 haffirs, and 30 dams.
6. Environmental Health: Implementation of a detailed intersectoral program (still under study).
7. Food Supply (Dura) in Certain Regions: Reduce to zero the problem of inadequate supplies of dura for 100 percent of population either by expanding areas of dura production and/or increasing field on existing lands.
8. Onchocerciasis: The percentage of skin positives and/or nodule positives in school-age children, and number of new cases of economic blindness.

PROJECT PURPOSE:

To accelerate, expand and strengthen the ability of the GOS to deliver primary health care services to the rural areas of the Sudan

Conditions that will indicate purpose has been achieved:
End of project status: Minimum levels for achievement of project purpose

Significant increases in the number of:

1. Patients seen at the PHCU level,
2. Referrals from the PHCU to more specialized health facilities,
3. Immunization sessions promoted and conducted at the PHCU level,
4. Health education activities undertaken,
5. Community health activities accomplished at the PHCU level, i.e. rural sanitation activities, etc.,
6. Curative care services provided at the PHCU level.

OUTPUTS:

1. Recommendations/report regarding AID assistance 1981-84 for PHCP and other GOS health priorities—to include possible cooperation with other donors in major endemic and communicable diseases. ✓
2. Standardized national data system for PHCP.
3. Improved national vital statistics registration system through PHCP.
4. National logistics system designed for PHCP.
5. Reports of short-term advisors.
6. Mid-course evaluation with recommendations for future AID assistance. ✓
7. Completion of reorientation training courses.
8. Completion of refresher training courses.
9. Completion of short-term third country training.
10. Completion of long-term U.S. participant training.
11. Completion of short-term U.S. participant training.
12. Printing/distribution of PHCP data forms.
13. Improved information sharing between ministries and Northern and Southern Regions.
14. Improved equipment/drug supply delivery.
15. Improved supervision of regional health supervisors and CHWs.
15. Delivery of initial drug/equipment supplies.
17. 1980 data survey.
18. Completion of 35 PHCUs.

MAGNITUDE OF OUTPUTS:

1. Report submitted to USAID/S.
2. National data system for PHCP accepted/approved by Northern and Southern Regional Health Ministries.
3. National vital statistics registration system designed/approved and functioning through PHCP.
4. National logistics system designed/functioning.
5. Short-term advisor reports submitted to USAID/S.
6. Evaluation report submitted to USAID/S.
7. 103 reorientation courses completed/4,120 supervisory medical persons trained.
8. 28 refresher courses completed/1,120 CHWs trained.
9. Certified third country training completed by 36 Deputy or Assistant Health Commissioners.
10. MA/equivalent degree training successfully completed by three GOS health employees.
11. Certified U.S. short-term training completed by 12 MOH personnel.
12. PHCP data forms distributed and in use by all functioning PHCUs.
13. Increased document sharing by ministries and Northern and Southern Ministries of Health.
14. Improved equipment/drug supply delivery to all Northern PHCUs and dispensaries by project vehicles.
15. Increased supervisory visits to provinces and PHCUs.
16. Delivery of initial equipment/drug supply to 35 PHCUs and 600 nomad CHWs.
17. 1980 data survey completed and results analyzed.
18. 35 PHCUs completed/staffed/supplied with equipment and drugs/funded by MOH for future recurrent costs.

ASSUMPTIONS FOR PROVIDING INPUTS:Beginning of Project Status:

USAID/SUDAN records

1. National primary health care program 1977-84 approved, published and given high priority by GOS.
2. Community health priorities:
 - a. Trained to date: 420
 - b. In training: 700
3. In four western provinces where AID will supply funds for construction of PHCUs or dispensaries and supply initial equipment and drugs:
 - a. PHCUs completed to date: 287
 - b. Dispensaries completed to date: 156
4. Baseline study performed in two northern and one southern province December 1976.
5. Health data/management information system for primary health care program designed, tested, modified and approved.

GOS/Ministry of Health/Primary Health
Care records

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

ASSUMPTIONS FOR ACHIEVING GOAL TARGETS:

Comparison of health sector goals with actual achievements.

National priority to health does not diminish.

ASSUMPTIONS FOR ACHIEVING PURPOSE:

1. Construction/training/supply records-MOH.
2. MOH/PHCP records.
3. MOH Training records.
4. MOH/USAID/S records.
5. MOH/USAID/S records.
6. On-site inspection.

1. Commitment to deliver primary health care services to rural population remains a high national priority.
2. Sufficient funding to carry out the 1977-84 primary health care program is forthcoming on a timely basis.

ASSUMPTIONS FOR ACHIEVING OUTPUTS:

1. USAID/S Project Manager.
2. Regional Ministries of Health.
3. Regional Ministries of Health.
4. Ministries of Health/PHCU logs.
5. USAID/S Project Manager.
6. USAID/S Project Manager.
7. MOH records.
8. MOH records.
9. MOH/USAID/S records.
10. MOH/USAID/S records.
11. MOH/USAID/S records.
12. Survey of PHCUs submitting properly completed data forms.
13. Regional Ministries of Health.
14. PHCU supply logs.
15. Inspection of PHCU visitor and inspection logs.
16. PHCU/Nomad CHW supply logs.
17. Regional Ministries of Health.
18. On-site inspection.

1. Continuing and increasing cooperation between northern and southern regional Ministries of Health in the areas of data collection, information sharing, logistics and funding for PHCP.
2. Expanded ability by MOH to maintain and operate USAID supplied commodities.
3. Ability of MOH to nominate and release appropriate staff for training.
4. Local community commitment to select CHWs and provide self-help funds and labor for PHCU construction.

INPUTS:	IMPLEMENTATION TARGET (TYPE AND QUANTITY):	
<u>AID:</u> 1. <u>Technical Assistance</u>	<u>AID:</u> 1. Technical assistance 140 person months	\$1,413,638
a. 1 MD/community medical advisor - 36 PM b. 1 Vital statistics data expert - 36 PM c. 1 logistics/supply expert - 36 PM d. 3 short-term advisors per year--3 mos, ea. - 27 PM e. 3 short-term advisors for mid-course evaluation 4 1/2 PM		
2. <u>Training</u>	2. Training	759,200
a. In-country (1) Reorientation training for supervisory medical personnel. (2) Refresher courses for community health workers. b. Third country community health training for Deputy or Assistant Health Commissioners. c. Participant training-US (1) Long-term (a) Statistics - 12 mos. (b) Public health - 12 mos. (c) Management/logistics - 12 mos (2) Short-term 4 participants per year		
3. <u>Commodities/Supplies</u>	3. Commodities/supplies	2,207,538
a. Printing of health data forms for CHWs. b. Photocopy machine. c. 50 supply/supervisory vehicles. d. Equipment/supplies for 35 primary health care units and 600 nomad CHWs. e. Initial drug supplies for 35 primary health care units and 600 nomad CHWs. f. Data survey 1980.		
4. <u>Construction</u> 35 primary health care units.	4. Construction	TOTAL 949,890
		Sub Total 5,330,267
		10% contingency 533,026
		TOTAL 5,863,293

GOS Financial Inputs Directly Associated With Project:

1. Salaries for personnel trained with AID funding (2. a., b., c. above) FY 78-80 (includes salaries of 280 nomad PHCWs and 35 settled PHCWs).
2. GOS recurrent costs FY 78-80 associated with AID funded commodities (3. a., b., c., d., e., f., above).
3. Equipment/supplies/drugs - recurrent costs - for PHCUs constructed by AID - FY 78-80.

GOS:

- | | |
|---|------------------|
| 1. FY 78-80 salaries for trained personnel | \$20,631,989 |
| 2. Maintenance, fuel, depreciation, drivers, etc. to operate AID funded commodities FY 78-80. | 480,750 |
| 3. Equipment/supplies/drugs for 35 PHCUs and 600 nomad PHCWs FY 78-80. | <u>1,471,911</u> |
| TOTAL | \$22,584,650 |

PART 3: PROJECT ANALYSES

A. Technical Analysis Including Environmental Assessment

1. Appropriateness of Technology

AID's project will support the activities of the GOS Primary Health Care Program. The underlying theme of the PHCP is the delivery of a balanced program of curative, promotive and preventive care to the people of Sudan -- particularly the rural poor and the nomads.

The PHCP itself is based upon a concept currently being tried in other LDCs which utilizes a lower level para-professional worker to perform a small number of health related activities. This person, the Community Health Worker (called a village health worker or rural health worker in other developing countries) is selected in Sudan from persons with primary school education. They receive health training over a nine month period, using curricula and training materials that have been adapted from similar programs in other LDCs. Thus, the level of capability of the CHW and the skills they are expected to learn are essentially compatible. In this way, only health technology which is appropriate and supportable in a Sudanese rural environment will be introduced.

AID assistance is also being channeled into a program which the Sudanese themselves have designed with the assistance of WHO experts. This plan has been developed in keeping with the technological constraints of the country. This is reflected in the types of equipment, drugs and other supplies which will be utilized at the PHCU level. This same approach has been used in designing the PHCUs and the logistics/supply system which will support the PHCP.

Two other important factors illustrate the technological soundness of the project. First, the GOS, with technical assistance from WHO, has performed baseline health/social/economic/demographic analyses in three provinces. These will be used to evaluate program performance and outcome over the next six years of the project. Second, a health data/management system has also been designed, again with WHO assistance, and pre-tested in three provinces. Thus, two additional basic elements of the PHCP -- the information and evaluation systems -- have been developed and tested in the context of Sudan's special needs, circumstances and technological constraints.

AID's project inputs to the PHCP will be entirely consistent with the GOS' strategy of utilizing a health technology which is appropriate to Sudan's requirements.

2. Suitability of the Technology for Replication and Diffusion

The concept of the community, rural or village health worker has been introduced into a number of developing countries within the past 30-40 years. To date, most of the experience with this approach has involved activities at fairly circumscribed levels, except in the case of the "barefoot doctors" in China. Nevertheless, it is a concept which has gained wide acceptance in the international health field.

The suitability of using the CHW to deliver services at the rural level in Sudan is currently being tested. Obviously, the program in Sudan is too new to be able to draw any conclusions about its applicability, replication and diffusion. There are several important factors, however, that reflect positively on the GOS' ability to successfully implement this program on a national scale. These include:

- the PHCP was developed in a systematic and analytic way, with the assistance of WHO experts and with inputs from several GOS agencies, community groups, university professionals, and other qualified persons;
- the PHCP is designed to accommodate the individual needs of the various parts of the country as well as the requirements of different population groups (e.g. nomads);
- the accomplishments of the PHCP to date have been significant, particularly when it is remembered that the resource inputs have almost exclusively been provided by the Sudanese themselves;
- the health activities promoted through self-help have been impressive, particularly in the North and in the wealthier provinces;
- the training of CHWs is related closely to their own capabilities and motivation, as well as to the specific health needs of their own communities;

- the responsibilities assigned to the CHWs are small in number and represent a manageable range of tasks;
- the PHCP includes plans for periodic program evaluation. This will allow the GOS to modify its implementation activities as more experience is gained with the program.

Thus, the technology being used in the PHCP would appear to be suitable for Sudan. It is reasonable to expect that the program can be extended to encompass the whole country. AID's inputs would not be imposing unrealistic or overcomplicated technology upon the GOS health sector. Instead, U.S. resources would ensure that the GOS would be able to accelerate the expansion of the program into the most needy areas.

3. Environmental Implications

The environmental implications of the project are not capable of pollution or deleterious action. The environment in fact will be improved because of health education of the public and greater use of safe water supplies and sanitary waste disposal facilities.

4. Cost Estimates for Technical Inputs

The equipment, supplies, drugs and vehicles which are to be used in the PHCP were selected by the Sudanese with the assistance of WHO professionals. The commodities to be funded by AID were chosen from these lists. The costs for these items are reasonable and appropriate.

5. Summary Technical Analysis

On the basis of the above factors -- appropriateness of technology, suitability of the technology for replication, absence of negative environmental impact, and reasonableness of technical costs -- this project is technically sound and consistent with all aspects of FAA Section 611(a) and (b).

In addition, this project responds to the most recent FAA guidance, and to the Agency's general policy directives and mandates concerning least income recipients and beneficiaries. It is also in keeping with specific AID sector policy statements including:

- Responsibilities for Nutrition A-198,
- Health Planning and Sector Assessment A-611,
- Population: Administrator's Population Policy Guide Supp. D1a, HB2 TM:2:14.

B. Financial Analysis and Plan

1. Overview of the GOS Financial System

The GOS is decentralized and divided into two financial systems, one incorporating the 12 provinces of the North, and the other the 6 provinces of the South. Each region has its own system of Ministries and source of tax and non-tax revenue. Allocations for recurrent and development expenditures are made by the central government and channeled through the Northern (called Central) and Southern (called Regional) Ministries of Finance and Planning. Other Ministries, such as the Ministry of Health, request Finance and Planning for funds to meet expenditure requirements. In the North, recurrent expenditure is primarily the responsibility of "local governments" or provincial councils located in the capitals of each province. In the South, however, recurrent expenditure is met by the implementing Ministries.

Thus, because of (1) the distinct nature of the Northern and Southern financial systems, and (2) the differing economic conditions which call for different project requirements, the financial viability of AID inputs to the Central and Regional Ministries of Health will be dealt with separately.

2. The North

a. GOS Inputs to the Health Sector

During the past 7 fiscal years, the health sector's share of government revenues remained a fairly constant 9-10% with the exception of 1974/75 when it fell to 7.7%. From 1970 to 1975, health sector capital investment increased at an average rate of nearly 20%, and recurrent expenditure at 9%, subsequently increasing the availability of health resources relative to population. However, in real terms, much of this increase was absorbed in meeting the rising costs of all components of health care delivery, (e.g. drugs, food supplies, salaries to personnel), that resulted from a rampant inflation rate in excess of 20% per annum. In fact, allocations to the health sector for capital and recurrent costs as a percentage of total government expenditures have fallen steadily from 8.8% in 1971/72 to 5.6% in 1974/75, as summarized in Table I. However, during the past two fiscal years the health sector's share of public expenditures has steadily improved, and appear to repre-

sent a respectable commitment to health when compared with countries of similar per capita income. For example, in 1976 the health budgets of the C.A.E., Ethiopia and Zaire were 5.3%, 5.4% and 2.7% respectively. (1)

The GOS has indicated an early and strong commitment towards rural development. A major element of this scheme is the PHCP which has received wide political and financial support. Over a one-year period (1976/77 - 1977/78), approved allocations to the PHCP to meet recurrent expenditure has increased 125% and now accounts for 2.3% of the total provincial recurrent budget for health. By the same token, approved development expenditures for the PHCP has jumped 800% over a one-year period, and represents 58.6% of the MOH development budget versus 23% in 1976/77. (2) These figures are indicated in Table 2.

b. The Economic Framework

Although stunning increases in development and recurrent expenditure towards the PHCP have been registered, fluctuations in allocations to the health sector in general are a reflection of the economic difficulties that Sudan has had to face.

Overall, the economic difficulties that confront the GOS are the result of a low domestic savings rate, especially in the public sector, slow progress in improving the country's transportation system, a general limitation of absorptive capacity reflecting shortcomings in the institutional infrastructure, and a deterioration in the country's terms of trade. Recent attempts by the GOS to increase investments have come up against a foreign exchange constraint by import inflation and a poor out-turn on exports.

Aggravating the situation is the GOS practice of implementing a separate development budget without meeting expenditure from normal revenues; development expenditure is high and increasing. The outcome has been severe budget deficits. These deficits have led to the

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- (1) Mary Susan Ueber, The Health Policy Process: If you want to win you have to play the game, an unpublished dissertation, 1977.
 - (2) The difference between approved and released allocations for recurrent and dev. expenses is a LS 5 million appropriation soon to be released to the provincial councils for PHCP activities.

imposition of limitations on imports which in turn has caused, through lack of equipment replacement, declining production in both agriculture and agro-industries. These economic ills have also helped to erode the price competitiveness of Sudan's agricultural produce, the principal export revenue earner. The aid expected to cover these deficits has failed to materialize and prospects for inter-Arab ventures in Sudan are suffering. The difficulty in generating public and private savings to finance investment is reflected in continually rising GOS borrowings from its Central Bank (as summarized in Table 3). Domestic borrowings from the Central Bank has nearly doubled the money supply. This has further aggravated inflation, which is now running at a rate of 20% to 25% per annum.

To combat these problems, the GOS has turned to rigorous internal fiscal management, and the taxation measures planned in the 1976/77 budget added about 10% to GOS revenues. However, the already existing high tax ratio has allowed little room to maneuver on the revenue side, and despite efforts to hold down defense expenditures and eliminate subsidies, the growth of recurrent expenditures has proven difficult to reduce in the short run. Indeed, the area with recurrent expenditures that is most vulnerable to cutbacks is the social service sector. Externally, the high debt service ratio places severe constraints on the GOS unless concessionary assistance is forthcoming to finance the vast infrastructure required to support directly productive investments.

However, in the long run, the future prospects of Sudan look good. With its large stock of unexploited resources, IBRD projections indicate economic growth and a steady improvement in living standards over the next decade. Key economic indicators are presented in Table 4. Actual performance, however, will hinge on the level of external capital inflows, public and private investments and the government's ability to adapt its administrative and technical services to tackle the various problems outlined above.

c. Other Donor Inputs to the Health Sector

On paper donor commitments to the health sector (other than AID's) have been large, totalling about 17 million. However, in reality, the amount of funding

received since 1974 has been small, and only 9% of the total commitments delivered has gone to the PHCP (see Table 5). Consequently, during the three-year time frame envisaged for the project, AID will be the only major donor to this very important program.

The importance of external assistance to the PHCP cannot be over-emphasized. Officials in the MOH have indicated that the ability of the PHCP to draw funds from Finance and Planning is largely dependent on the extent of funding generated from other sources. As with self-help activities, the GOS is more willing to finance the capital and recurrent expenditure of those projects that can contribute funds of their own.

d. Summary Cost Estimates and Financial Plan

The project as outlined on the tables on the following pages would increase the recurrent costs of the PHCP by roughly one-third over 1977/78 in the first year, double during the second, and increase by another third during the final year. (A detailed breakdown of recurrent expenditure over the life of the project is found in Table 6.) It is important to determine what effect this will have on the health budget as it too will be expanded by activities other than those related to the AID-financed project. By how much AID inputs will affect total demand on resources in coming years is difficult to predict as future demand is not easily quantified. However, for illustrative purposes, some crude projections of the health sector recurrent budget of provincial governments (responsible for covering all current and future ongoing expenditure generated by the PHCP and other health sector activities) can be made. If the ongoing costs associated with AID inputs are small relative to the total, it can reasonably be assumed that an expansion in the PHCP as envisioned by AID can be supported financially. This must particularly be the case in the four western provinces where most of the construction will take place.

Thus far, expansion in the health sector (i. e., expansion of capital expenditure and related recurring costs) has been much less than originally anticipated. In 1975/76 the MOH projected development and recurrent costs over the life of the Six Year Plan. The costs were based

Summary Cost Estimate and Financial Plan

AID APPROPRIATED

USE	FX	LC	TOTAL
I. Technical Assistance			1,413,638
A. Long Term			
1. 1 MD/Community medical advisor @ \$146,254 x 3 years (36 PM)	438,763	---	
2. 1 vital statistics data expert @ \$109,146 x 3 years (36 PM)	327,438	---	
3. 1 logistics/supply expert @ \$109,146 x 3 yr. (36PM)	327,438	---	
B. Short Term			
1. 3 advisors per year x 3 mo. @ \$10,000 per mo. (27 PM)	270,000	---	
2. 3 advisors for mid-term evaluation 1.5 mo. @ \$10,000 per mo. (5 PM)	50,000	---	
II. Training			759,200
A. In Country			
1. Reorientation training for 5900 supervisory medical personnel (per diem/other costs for participants/trainers; transportation, supplies) 103 courses x \$3500	--	360,000	
2. Refresher courses for CHWs (per diem, transportation, supplies) 28 courses x \$2000.	--	56,000	
B. Third Country Short-Term			
1. Public/community health training for deputy or assistant health commissioners at Cairo Institute 36 participants 3 mos. ea. @ \$5,500	198,000		

USE	FX	LC	TOTAL
C. Participant Training - U.S.			
1. Long Term			
a. Statistics - 12 mos.	15,200	--	
b. Public health - 12 mos.	15,200	--	
c. Management/logistics - 12 mos.	<u>15,200</u>	--	
	45,600		
2. Short Term			
a. 12 participants 3 mos ea. @ \$8,300	99,600	--	
III. Commodities/Supplies			2,207,538
A. Printing costs		150,000	
B. Photocopy machine	2,500		
C. Data survey		30,000	
D. 24 5-Ton transport trucks @ 36,000 CIF Port Sudan + 30% spare parts + 10% inflation = 51,480	1,235,520		
E. 26.4 Wheel Drive vehicles @ 10,000 CIF Port Sudan + 30% spare parts + 10% inflation = 14,300 ea.	371,800		
F. Equipment and instruments for 35 PHCUs and 600 nomad CHWs	198,921		
G. Drugs and supplies for 35 PHCUs and 600 nomad CHWs	218,297		
IV. Construction			949,890
35 PHCUs @ 21,165			
23 @ 21,165 + 20% inflation for 1 yr = 25,398 ea.	584,154		
12 @ 21,165 + 20% inflation for 2 yrs = 30,478 ea.	365,736		
Sub Total	4,734,267	596,000	5,330,267
10% Contingency	473,426	59,600	533,026
TOTAL	5,207,693	655,600	5,863,293

GOS

USE	FX	LC	TOTAL
I. Personnel			20,431,895
A. Salaries for			
1. 1,450 M.A.s @ \$2,040 x 3 yr.	--	8,874,000	
2. 1,200 nurses @ \$1,275 x 3 yr.	--	4,590,000	
3. 3,200 village midwives @ \$306 (yearly incentive) x 3 years	--	2,937,600	
4. 835 (settled) CHWs @ \$847 x 3 years	--	2,121,735	
5. 600 (Nomad) CHWs			
a. 320 @ \$847 x 1 year	--	271,000	
b. 450 @ \$847 x 1 year	--	381,150	
c. 600 @ \$847 x 1 year	--	508,200	
6. 36 Regional M.A.s @ \$3315 x 3 years	--	358,020	
7. 3 long term participants @ \$5610 x 3 years	--	50,490	
8. 12 short term participants (Assistant Commissioners of Health)	--	339,660	
II. In Country Training			200,094
A. 280 Nomad CHWs @ \$70.58 per mo. x 9 mos.	--	177,861	
B. 35 settled CHWs @ \$70.58 per mo. x 9 mos.	--	22,233	
III. Commodities/Supplies			1,952,661
A. Maintenance for 1 photocopy machine	--	750	
B. Fuel, insurance and maintenance for 24 supply/transport trucks	43,200	43,200	
C. Fuel, insurance and maintenance for 26 4 wheel drive vehicles	46,800	46,800	

USE	FX	LC	TOTAL
D. Drugs & supplies for			
1. 35 PHCUs @ \$357 (for a 2 mo. supply) assuming a construction rate of 23 PHCUs in year 2 and 12 PHCUs in year 3	111,741	--	
2. 600 Nomad CHWs @ \$178.50 per CHW (for a 2 mo. supply)	1,360,170	--	
E. Printing of data forms @ \$150,000 x 2 years	--	300,000	
<hr/>			
TOTAL GOS INPUTS	1,561,911	21,022,739	22,584,650

on an implementation schedule outlined in Part II, A. 3. of this PP. However, at present, the PHCP (where the bulk of anticipated health sector expansion is expected to take place) has not moved ahead according to schedule. Development expenditure during FY 1977/78 was originally projected to reach LS 10 million. So far, only about LS 4 million has been approved and LS 384,000 disbursed. By the same token, recurrent expenditure over FY 1976/77 and 1977/78 has been about one-quarter of what was originally planned (i. e., LS 578,000 vs LS 2.4 million in 1977/78). Financial pressures caused by soaring inflation and limited funds have dictated a scaling down of planned capital inputs. Instead, the GOS is relying more heavily on self help activity.

Assuming the present rate of capital investment as funded by self help and central government grants continues, recurrent expenditure can be expected to total about one quarter of what was originally projected during the next three years (1977/78 - 1979/80), or LS 2.4 million. An additional 20% per annum of costs (due to inflation and other factors) will raise the total to about LS 2.7 million. This is illustrated in the first column of the table below. Column 2 lists current and future expenditure of provincial governments in the health sector (again adding an escalator clause of 20% per annum).

The additional recurring costs associated with AID inputs would represent less than 1% the first year, nearly double to 1.7% the second year, and finally increase a mere .2% to represent 1.9% by 1979/80. In proportion to the recurrent expenditure of the health sector in general, this is a very small percentage increase.

Recurrent Expenditure Requirements of All Provinces*

FY	Column 1 (Modified) recurrent costs of PHCP as projected by GOS	Column 2 Projected health sec- tor recur- rent budget for western provinces	Column 3 Projected total costs other than AID-related	Column 4 Recurrent costs associated with AID inputs	AID as a % of total
1977/78	578,000	21,000,000	21,578,000	213,432	.98
1978/79	960,000	26,000,000	26,960,000	486,626	1.70
1979/80	1,200,000	32,000,000	33,200,000	641,662	1.90

* LS 1 = \$2.55

The same procedure can be followed to make recurrent cost estimates for the four western provinces only (Northern and Southern Darfur, Northern and Southern Kordofan). Based on the same assumptions outlined above, recurrent expenditure for the PHCP can be expected to be about one-quarter of its original estimate: roughly LS 935,000 over the next three years (see Column 1 in the following table). This estimate is probably high as the regions are poor and not expected to generate much revenue for capital investment. AID inputs going exclusively to these four provinces plus the remainder (divided by 12) will mean an increase in the recurrent budget of roughly LS 482,700 over the next three years (see Column 4).

During 1975/76 (the last year data were available) the four provinces accounted for roughly 25% of the recurrent budget for health. Arbitrarily assuming this trend has continued would mean a recurrent budget of roughly LS 8.25 million during 1977/78. Assuming, additionally, a 20% per annum escalation in health sector recurrent expenditure over the next three years, recurrent costs of AID inputs would account for 1.4% in 1977/78, would increase by 1.2% over 1978/79, and another .3% over 1979/80 (see Column 5).

Recurrent Expenditure Requirements of Western Provinces*

FY	<u>Column 1</u> (Modified) recurrent costs of PHCP as projected by GOS	<u>Column 2</u> Projected health sec- tor recur- rent budget for western provinces	<u>Column 3</u> Projected total costs other than AID-related	<u>Column 4</u> Recurrent costs associated with AID inputs	AID as a % of total
1977/78	230,000	5,250,000	5,480,000	76,700	1.4
1978/79	315,000	6,300,000	6,615,000	174,000	2.6
1979/80	395,000	7,560,000	7,955,000	232,000	2.9

* LS 1 = \$2.55

In summary, future demands on resources are projected not to be as high as originally anticipated, and AID project related current costs will represent only a minuscule increase in the total budget. For all provinces the overall increase is expected to be about 1.6%, and for

the four western provinces alone, slightly higher at 2.4%. Most important for these four provinces is the fact that the Ministry of Finance (responsible for disbursing funds to the provinces for their recurrent budgets) has sufficient flexibility to appropriate additional money to these poorer provinces when necessary. These provinces are unable to raise local revenues as easily, and are thus more dependent upon central government grants.

Furthermore, the foreign exchange requirement of the project is not burdensome, representing over the next three years only a small percentage of projected currency reserves (i. e., representing 2.0% by 1979/80).¹⁾ The implication of this is that aggregate project costs are sensibly geared to the budget constraints placed on the MOH and the provincial councils. Projected costs are reasonable and can be supported financially.

In addition, recent experience has indicated that the financial management capability of MOH/PHCP officials is adequate. Over the past year the numerous gains made by the efficient and equitable use of very limited resources has been most impressive.

Finally, as the Sudanese economy is in a state of flux, problems with budgetary constraints are expected to improve. However, until such time as revenue from net exports and other sources materializes, capital investments and recurrent expenditure growth must be paced carefully. In the long run, a project too large would become unmanageable and financially unsupportable. From a financial standpoint, this project lends itself to considerable maneuverability. As the economy expands and infrastructure strengthens, the scope of AID inputs can grow accordingly.

2. The South

a. Economic Situation

The Southern Region suffers from the same economic ills as the North, only the problems there are compounded. The war which ravaged the area until 1972 vitually rendered the region bankrupt and bereft of any infra- or superstructure.

1). Assuming a 10% annual rate of increase over 1976/77 levels.

Although faced with limited resources, the Southern Region in recent years has made impressive gains with the restructuring of its financial system and promotion of development activities. Due to its distance from the central government (Juba, the capital of the Region, is 1800 Km from Khartoum), the regional government has had difficulty in obtaining funds approved by the central government, particularly in the procurement of foreign exchange for capital expenditure. For example, in the PHC sector, MOH officials have not had sufficient convertible currency to purchase drugs, equipment and supplies.

Table 7 reveals the relative proportion of budgetary allowances approved, received and spent by the Regional Government and the Regional Ministry of Health. Although funding for the health sector has steadily improved, the level of assistance actually delivered has not.

Overall, revenues from tax and non-tax sources have increased substantially as shown in Table 8. However, this has not been enough to meet recurrent (salaries - Chapter I and services - Chapters II and III) and development expenditure. The result has been inflation and a growing budgetary deficit.

b. Donor Activity in the Health Sector

Donor commitments (other than AID's) from 1976/77 to 1979/80 are shown in Table 9, and are expected to total about \$16.6 million. Out of this total, external assistance to the PHCP accounts for only 6%. This number is under-estimated as many inputs to the PHCP program could not be quantified. From 1976/77 to 1977/78, external assistance to the PHCP rose from 2% of total aid to 12%. However, AID (through the AMRF proposal) will be the major donor to this very important program.

As in the North, external assistance to the PHCP is extremely important in terms of bargaining power and the subsequent ability to draw funds for development and recurrent expenditure. The Regional Ministry of Finance, Planning and Economic Development (in charge of appropriating money), is more willing to channel funds to projects that are matched with revenue from other sources.

c. The PHCP

The Regional Government has expressed a firm political and economic commitment to the expansion of rural development schemes. A major component of this is the PHCP of the South. The MOH is encouraging self-help activities to augment PHCP capital investment. Up till now, however, this has not met with much success as the region is impoverished. As CHWs are trained and manpower shortages are alleviated, it is believed that communities will be able to meet building requirements out of self-help funds and cheaper local materials. From past experience, this has proved successful in the area of education where each village built its own primary school from self-help activity.

Although still in the initial stages of development, the PHCP accounted for 51% of overall approved health development expenditure during this fiscal year as shown in Table 10. Such a financial commitment is significant indication of the importance of the program. Recurrent costs, primarily in the form of salary remunerations, represented 2.5% of the total MOH recurrent budget (also listed in Table 10).

The table on the following page lists approximate figures for project inputs by category as discussed by the project design team with the MOH-S and AMRF staff. Please refer to the AMRF proposal for a complete budget breakdown. Recurrent costs over the life of the five-year project total, roughly, \$1,130,000, or approximately \$226,000 per annum. This amount is equivalent to about 2% of the MOH FY 1977/78 recurrent budget -- a very small amount.

In light of recent trends indicating strong support for the PHCP, it can be expected that the regional government will meet expenditure requirements over the life of the project, and after its termination. AID inputs are only a part of the overall PHCP development strategy, the major responsibility being borne by the GOS itself. The project is financially viable in that it is geared to the budgetary limitations and absorptive capacity of the MOH. However, at the same time, the project leaves room for future expansion as the regional economy strengthens and local revenues grow to finance a greater level of activity.¹⁾

1). The area is fertile and rich with natural resources. Export revenues from cash crops such as coffee are expected to be forthcoming in the near future.

PROJECT COSTS ASSOCIATED WITH AMRF PROPOSAL (\$)*

	AID	AMRF/ OTHER DONORS	GOS
I. Personnel (includes technical assistance)	377,595	285,005	260,377
II. Training	268,870	---	26,110
III. Commodities and Supplies	640,285	121,300	505,053
IV. Other (including construction of 10 dispensaries, staff housing and transport costs)	1,339,110	32,280	338,800
TOTAL	2,625,860	438,585	1,130,340
Approximate Per Annum Expenditure			226,068

* \$2.55 = LS 1

TABLE I.

SUDAN HEALTH BUDGET, 1970/71 to 1976/77 (LS)*

Year	MOH Dev. Expenditure ^a	Recurrent Expenditure ^a			Recurrent Cost as a Percent of Gov. Rev.	Dev. & Recur- rent exp. as a Percent of Gov. Revenue ^c	% of total Govt. Expense ^c
		Min. of Health	Min. of Local Govt.	TOTAL			
1970/71	1,470,000	7,910,532	6,000,000	15,380,532	8%	9	9
1971/72	1,650,000	9,029,902	6,000,000	16,679,902	9%	10	8.8
1972/73	2,212,607	9,631,403	6,000,000	17,844,010	9%	10	8.6
1973/74	2,417,481	11,022,935	6,000,000	19,440,416	8%	9	7.3
1974/75	3,052,586	4,770,860*	14,521,691**	22,345,137	7%	7.7	5.6
1975/76	3,200,000	7,300,000	17,700,000	25,000,000	7.5%	8.5	6.1
1976/77	2,250,000	8,640,000	25,000,000	33,640,000	8.4%	9.0	6.3

* LS 1. = \$2.51

** Represents shift in ministry responsibility

Source: a. (1970/71 - 1974/75) GOS, National Health Programme 1977/78 - 1983/84 (Blue Book) (Khartoum, 1975), and (1975/76 - 1976/77) GOS, Ministry of Health, Khartoum
 b. GOS, National Health Programme, April 24, 1977
 c. IBRD

TABLE 2 (continued)

Activity	DEVELOPMENT			
	1976/77		1977/78	
	Approved	Spent	Approved	Spent
1. Supplement to PHCP self help activities (i.e., instruments to PHCU)	50,000	NIL	100,000 (50,000 revote)	100,000
2. Vehicles (11 mini-buses, ambulances, cars, trucks)	320,000	320,000	--	--
3. Tutor training (stipends & scholarships for 60 students)	7,500	7,500	--	--
4. CHW training (settled) Scholarships for 800 students @ 27.68/month/student	79,500	79,500	132,000	132,000
5. CHW training (Nomads) Scholarships for 320 students @ 27.68/month/student	31,800	31,800	53,000	53,000
6. Health data system	29,000	29,000	--	--
7. Renovation of Nomad CHW training schools	6,000	6,000	--	--
8. Equipment & instruments for Nomad CHWs	--	--	19,000	19,000
9. Health storage facilities: 1 central store & 3 facilities in 3 provinces (S.Darfur, S. Kordofan, Red Sea)	--	--	80,000	80,000
10. (a) Renovation & construction of PHCU & dispensaries (b) Supplies & equipment for new & renovated PHCUs & dispensaries (including those built by self help)				
Total #10	--	--	4,400,000 ^a	
GRAND TOTAL	523,800	473,800	4,784,000	384,000
% of total MOH Dev. Budget (approved and spent)	23	21	58.6	10.2

Source: MOH, Office of the PHCP

a. estimate

TABLE 2

RECURRENT AND DEVELOPMENT EXPENDITURES FOR THE PHCP (LS)
NORTH

Activity	RECURRENT			
	1976/77		1977/78	
	Approved	Spent	Approved	Spent
1. Salaries of tutors @ 450/yr x 60	27,000	27,000	27,000	27,000
2. Monthly stipend for tutors @ 260/yr x 60	15,600	15,600	15,600	NIL
3. Salaries of CHWs @ 332/yr x 1120	--	--	372,000	NIL
4. Transport	--	--	10,000	10,000
5. Drug & supply replacement for disp. & PHCUs built by self help ^a	--	--	111,324	NIL
6. Salaries of PHCP headquarters staff	--	--	21,000	21,000
7. Manpower costs for new dispensaries @ 1135/yr x 3	--	--	3,405	3,405
8. Depreciation on equipment & instruments for renovated PHCUs (25) & dispensaries (25) ^b	--	--	17,825	NIL
GRAND TOTAL	42,600	42,600	578,154	61,405
% of total provincial recurrent budget for health (approved and spent)	.17	.17	2.3	.31

Source: MOH, Office of the PHCP

- a. Estimate 121 PHCUs built in 1977/78 x 840/unit per annum for drugs & supplies and 3 dispensaries built x 3228/unit per annum.
b. @ 497/dispensary per annum; 216/PHCU per annum

TABLE 3
GOS FINANCIAL STATEMENT (LS.000)

	GOVERNMENT OF SUDAN ¹				Deficit Financing (NET)	
	Current Revenue	Expenditure		Overall Deficit	External Loans	Domestic Borrowing
		Development ²	Recurrent			
FY 1974/75	287,800	102,400	348,000	163	103,600	59,000
FY 1975/76	332,000	113,100	349,200	130,300	22,500	107,800
FY 1976/77	396,600	120,000	446,600	170,000	11,000	159,000

1. Source: Bank of Sudan, International Monetary Fund

2. Source: Ministry of Finance, Section for Local Government (estimate)

TABLE 4

SUDAN KEY ECONOMIC INDICATORS

(All values in U.S. million and represent period averages unless otherwise indicated)

Exchange Rate: LS 1 = US\$2.50 <u>a/</u>	1975	1976	Percent Change	Estimate 1977
INCOME, PRODUCTION, EMPLOYMENT				
GDP at current prices FY <u>b/</u>	3555	3925	10.4	4285
Per Capita GDP current prices FY	248	265	7.0	283
Gross fixed capital formation FY	535	620	15.9	708
Indices: (FY 69/70=100)				
Industrial Production	121	127	7.3	132
Agricultural Production	158	166	12.6	175
Labor Force (,000)	7761	8006	3.1	8251
Production				
Raw Cotton (,000 bales)	1160	572	(50.7)	800
Peanuts (,000 MT) FY	875	931	6.4	827
Sesame (,000 MT) FY	282	238	(15.6)	235
MONEY AND PRICES				
Money Supply (end of CY)	1044	1300	24.5	NA
Interest Rates (%)				
Bank of Sudan Rediscount	11	11	0.0	NA
Commercial Bank Prime	11	11	0.0	NA
Treasury Bills	3	3	0.0	NA
Indices: (1970=100)				
Wholesale Price FY	170	195	14.7	220
Consumer Price FY	192	222	15.6	250
BALANCE OF PAYMENTS AND TRADE (end of CY)				
Gold and For. Exch. Reserves	36	24	(33.3)	NA
External Public Debt (long term)	636	929	46.0	927
External Public Debt (short term)	435	525	18.4	NA
External Debt Service Ratio	28.1	20.7	(28.6)	NA
Balance of Payments	(416)	(156)	(62.5)	NA
Balance of Trade (payments)	(345)	(74)	(81.4)	NA
Balance of Trade (customs data)	(519)	(371)	(28.5)	NA
Exports (FOB)	381	483	26.8	600
US Share	8	19	138.0	NA
Imports (CIF)	900	853	(5.1)	NA
US Share	77	80	3.9	NA
Main Imports from US (1976): Machinery and Equipment, 34.5; Wheat, 27; Transport Equipment, 7.5; Manufactured Goods, 5.3				

NA = Not Available

a/ = Exchange rate of LS 1 = US\$2.87 used only for cotton exportsb/ = FY begins on July 1 of preceding year and ends June 30.

SOURCES: Bank of Sudan, IMF, Statistics Dept., US Embassy estimates

TABLE 5
EXTERNAL ASSISTANCE TO THE HEALTH SECTOR (NORTH)

PROJECT/ ACTIVITY	SOURCE OF ASSISTANCE	ASSISTANCE COMMITTED US \$ EQUIV.	DURATION BEGIN-END DATES	DELIVERED
A. Other Than the PHCP				
1. Activity Analysis	UNDP/IAEA	139,987	1975-76	139,987
2. PH Labs	UNDP/WHO	1,700,000	1972-79	1,214,286
3. Nutrition	UNICEF	13,300	-do-	-do-
4. Rehab. Service	WHO	20,230	1976	20,230
5. Epidemiology Survey	WHO	6,180	1976	6,180
6. Cerebro-Spinal Meningitis Control Pilot Studies	WHO	79,200	1974-77	NIL
7. T.A. on vital & health stats	WHO	79,000	1974-77	36,060
8. Occupational Health	WHO	43,900	1974-77	12,706
9. Dental Asst.	WHO	73,000	1976-77	19,759
10. Ag, medical, & water dev.	Canada	1,186,950	1975-76	1,186,950
11. Asst. to hospital	China	Unknown	1973	Unknown
12. Hosp. Admin.	Ireland	1,600	Feb.1977	1,600
13. Hosp. Equipment	Netherlands	500,000	1976	500,000
14. X-ray equipment (rural hosp.)	Netherlands	100,000	1976	100,000
15. Food Commodities	USA	5,000,000	1972-ongoing	5,000,000
16. Health Ed.	WHO/UNDP Ireland, USSR, Yugoslavia	112,839	1975-77	112,839
17. Endemic Disease Control	WHO, UNHER, U.K.	983,735	1974-78	983,735
18. Fellowships	IAEA, Belgium, China, Hungary, Czechoslovakia, Romania, Switzerland UNDP	55,193 (plus room, board & tuition where applicable)		55,193

TABLE 5 (continued)

COUNTRY/ AGENCY	ACTIVITY	AMOUNT COMMITTED	AMOUNT RECEIVED
B. THE PHCP			
Quatar	1. Vehicles for the PHCP	1,140,000 (1978)	NIL
WHO	1. Technical assistance & expenses incurred during the planning phase of the PHCP		
	2. 11 small busses		
	3. Small equipment for training center in Khartoum		
	<u>Total, WHO</u>	350,000 (1976-77)	350,000
UNICEF	1. 6 trucks to 6 provinces (4 in North; 2 in Southern Region)		
	2. Instruments & drugs for PHCUs		
	3. 1 truck per province		
	4. Equipment & vaccines for EPI to extend services to rural areas		
	<u>Total #1-4</u>	680,000 (1976-78)	508,000
	5. Expansion of activities 1-4 above		
	6. Reorientation courses for medical personnel		
	7. Information system of PHCP		
	<u>Total, #5-7</u>	1,500,000	Funds currently lacking
CRS	8. Expansion of nutrition activities to rural areas	300,000	Funds currently lacking
Holland	1. Instruments for Nomad PHCU and dispensaries	515,000 (1977)	NIL
ACCORD	1. Construction of a training center in North Kordofan		
	2. One vehicle, petrol and driver for the training center		
	3. Part time technical training assistance	100,000	20,000
	<u>Total</u>	919,000 (1977-80)	

TABLE 5 (continued)

COUNTRY/ AGENCY	ACTIVITY	AMOUNT COMMITTED	AMOUNT RECEIVED
World Food Program	1. Food items to CHWs and rural areas to support self help activities 2. Transport for food deliveries <u>Total</u>	820,000 (1978-81)	Paper work still being completed
British Overseas Dev. Ministry	1. The development of PHC com- ponents in an agriculture project in Southern Darfur	Unknown (negotiations not yet finalized)	--
African Development Bank	1. Loan for development of PHCP in 4 provinces. To provide 1 dispensary, 5 PHCUs, sup- plies, instruments and trucks for each province: White Nile, Blue Nile, N. & S. Darfur	2,400,000	NIL
	SUBTOTAL	6,805,000 (1976-81)	878,000
	GRAND TOTAL	17,129,114	10,267,525
	PHCP contributions as a % of total	40	9

TABLE 6
ESTIMATED RECURRENT COSTS ASSOCIATED WITH AID INPUTS TO THE PHCP (\$) ¹

ITEM	1977/78		1978/79		1979/80		TOTAL
	FX	LC	FX	LC	FX	LC	
1. New Nomad CHW salaries (130 additional in year 2 & 150 additional in year 3)	--	--	--	110,110	--	237,000	347,110
2. New (settled) CHW salaries (11 in year 1, 23 in year 2, 35 by year 3)	--	9,317	--	19,481	--	29,645	58,443
3. Photocopy machine							
a. 10% purchase price for maintenance	--	250	--	250	--	250	750
b. 20% p.a. depreciation	500	--	500	--	500	--	1,500
4. Salaries of 50 drivers @ \$979 P.A. per driver	--	48,950	--	48,950	--	48,950	146,850
5. 24 Supply trucks							
a. Maintenance & ins. (.05 of purchase price)	--	14,400	--	14,400	--	14,400	43,200
b. Fuel (.05 of purchase price)	--	--	14,400	--	14,400	--	43,200
c. 20% p.a. depreciation	57,600	--	57,600	--	57,600	--	172,800
6. 26 4 wheel drive vehicles							
a. Maintenance & ins.	--	15,600	--	15,600	--	15,600	46,800
b. Fuel	15,600	--	15,600	--	15,600	--	46,800
c. Depreciation	62,400	--	62,400	--	62,400	--	187,200
7. Equipment & instruments							
a. 35 PHCU - 20% p.a. depreciation (1 year after construction)	--	--	1,542	--	3,225	--	4,767
b. 600 Nomads - 20% p.a. depreciation (1 year after training completed)	--	--	19,520	--	27,450	--	46,970

1. LS 1 = \$2.55

TABLE 6 (continued)

ITEM	1977/78		1978/79		1979/80		TOTAL
	FX	LC	FX	LC	FX	LC	
8. Drugs & supplies:							
a. 35 PHCUs	19,635	---	44,982	---	70,686	---	135,303
b. 600 Nomads	285,600	---	458,745	---	615,825	---	1,360,170
9. Printing of data forms	---	---	---	150,000	---	150,000	300,000
TOTAL	455,735	88,517	675,289	358,791	867,686	495,845	2,941,863
With inflation factor (20% p. a.)	544,252		1,240,896		1,636,237		3,421,385

TABLE 7
SPECIAL DEVELOPMENT BUDGET (SOUTHERN REGION) - OVERALL AND HEALTH ONLY (LS)

	Region Development Budget (from Central Govt.) ^a			
	Approved	Received & Spent	Remarks	% Remitted
FY 1972/73	1,401,413	560,000	Irregular remittances	40
FY 1973/74	7,329,500	676,133	Delay of remittances	9
FY 1974/75	7,135,510	1,696,404	Irregularity in flow of funds	24
FY 1975/76	7,164,248	1,623,484		23
FY 1976/77	15,331,963	3,600,000		23
FY 1977/78	NA	NA		

Source: a. Regional Ministry of Information and Culture, March 1977

TABLE 7 (continued)
 SPECIAL DEVELOPMENT BUDGET (SOUTHERN REGION) - OVERALL AND HEALTH ONLY (continued)

Budgetary Allocations for Development Projects for the
 Health Sector^a

	FY1973/74		FY1974/75		FY1975/76		FY1976/77		FY1977/78	
	Approved	R&S*	Approved	R&S	Approved	R&S	Approved	R&S	Approved	R&S
Central Dev. Budget	393,331	NA	503,089	NA	178,035	NIL	670,000 (200,000 revote)	235,000	--	--
Special Dev. Budget - Special grant from Central Budget	150,000	NA	372,650	NA	395,216	NA	1,497,736	405,000	3,300,000 ^b	NIL
Health Dev. Budget - Raised by local revenues	--	--	--	--	66,080	66,080	NA	NA	NA	NA

* R&S = Received and Spent
 NA = Not available

Source: a. Regional Ministry of Finance, Planning and Economic Development
 b. Estimate

TABLE 8
REVENUE AND CURRENT EXPENDITURE OF REGIONAL GOVERNMENT
AND THE REGIONAL MINISTRY OF HEALTH (LS.000)

	REVENUE ^a					
	1975/76		1976/77		1977/78	
	Approved	Received	Approved	Received	Approved	Received
I. Regional Government						
Regional Revenue (Tax & non-tax)	5,758	--	8,768	--	14,028	
Grant from Central Govt.	NA	--	10,721	--	12,721	--
SUBTOTAL	5,758	5,588	19,489	8,958	26,749	10,320
Central Govt. Grant to provinces	7,000 ^b	7,500	7,078	7,500	8,079	7,500
GRAND TOTAL	12,758	13,088	26,567	16,458	34,828	17,820
Received/approved		1.02		.62		.51
II. MOH						
-Revenue ^c			2.0		2.5	5.0
-from Central Govt.			2,700.0		2,400.0	4,200.0
GRAND TOTAL			2,702.0		2,402.5	4,205.0

	RECURRENT EXPENDITURE ^a								
	Regional Government				MOH				
	Chap. I	Chap. II & III ^d	Total	Deficit	Chap. I	Chap. II & III ^d	Total	Deficit	MOH Recurrent Exp/ Reg. Govt. Recurrent Exp.
1975/ 1976	NA	NA	NA	NA	1,700	1,000	2,700	NIL	NA
1976/77	10,000	16,400	26,400	9,942	1,900	1,500	2,400	NIL	.09
1977/78	13,000	17,800	30,800	12,980	2,400	1,800	4,200	NIL	.14

a. Ministry of Finance, Planning and Economic Development

b. Estimate

c. Derives from fees & charges for goods, services and dept. fees and charges from 1) hospitals, 2) medical fitness exams, 3) age assessments.

d. Includes central govt. grants to province councils for services and salaries (i.e., dispensary, dressing station staff, primary school teachers).

TABLE 9
EXTERNAL ASSISTANCE TO HEALTH (SOUTHERN REGION) (LS)

AGENCY	ACTIVITY	LOCATION	1976/77	1977/78	1978/79	1979/80
A. OTHER THAN PHCP						
WHO	1. Trypanosomiasis	Region	33,133	27,200	--	--
	2. Health Institute Training	Wau	37,885	30,617	--	--
	3. Rural Water Supply	Region	21,199	7,888	--	--
UNICEF	1. Services for Children					
	a. Rural Water Supply	Wau	340,000	170,000	136,000	--
	b. Donated Milk Powder	Region	17,000	17,000	15,300	--
World Food Program	1. Rural Dev. in the South	Region				
	2. Nat'l. School Feeding Expansion	Region				
	3. Sawmilling & Forestry Development	Region				
	Total, WFP		2,058,333	1,341,667	312,500	--
Sudan Council of Churches	1. Water Development Programme	Lakes Prov.	25,582	56,250	56,250	56,250
	2. Akobo Hospital	Jonglei Prov.	80,000	91,000	56,250	56,250
Lutheran World Federation	1. Nasir Hospital	Upper Nile Prov.	5,000	7,500	--	--
	2. Health Center Maiwut	UNP	--	30,000	--	--
German Leprosy Relief Assoc.	1. National Leprosy Control and Training Center	Wau-Agok	700,000	330,000	--	--
	SUBTOTAL		3,318,132	2,109,122	576,300	112,500

TABLE 9 (continued)

AGENCY	ACTIVITY	LOCATION	1976/77	1977/78	1978/79	1979/80
B. THE PHCP						
German Caritas	1. Hospitals, dispensaries (7 completed; 3 to be built) PHCU (10 completed)	W.Equatoria	--	113,000	--	--
	2. Renovation of Li Rangu Training Center	W.Equatoria	NA	--	--	--
Lutheran World Federation	1. PHCU (4 to be constructed/supplied)	Upper Nile Province	8,000	--	--	--
	2. Self help schools, dispensaries (2 to be constructed/supplied)	UNP	10,000	--	--	--
WHO	1. Public Health Advisory Services	Region	--	--	--	--
UNICEF	1. Services for Children a. Health, education, social welfare, nutrition	Region	34,000	102,000	68,000	--
	2. Special Assistance: PHCP	Region	--	68,000	--	--
ACROSS	1. Dispensaries (2 completed; 5 to be built), PHCUs (5 to be built)	Lakes	NA	NA	--	--
Norwegian Church Relief	1. Dispensaries (4 completed; 6 to be built), PHCUs (3 completed; 7 to be built)	E.Equatoria	NA	NA	--	--

TABLE 9 (continued)

AGENCY	ACTIVITY	LOCATION	1976/77	1977/78	1978/79	1979/80
AMRF OXFAM CORDEL Brodfur diewelt UNICEF	1. Renovation of Rejaf Training Center (plus supplies)	W. Equatoria	NA	NA	--	--
WHO UNICEF	1. 100 Bicycles (for CHWs); 45 motorcycles (for MAs)	Region	NA	NA	--	--
	2. Drugs, supplies, instruments (for PHCUs & dispensaries built by donor activity)	Region	NA	NA	NA	--
Subtotal of Quantifiable Components			52,000	283,000	68,000	
GRAND TOTAL			3,370,132	2,392,122	644,300	112,500
PHCP contributions as a % of total			2	12	11	0

NA = not available

TABLE 10
 RECURRENT AND DEVELOPMENT EXPENDITURE FOR THE PHCP (LS)
 SOUTHERN REGION (FY 1977/78)

<u>R E C U R R E N T</u> ¹		Chapter II (Services)	Approved	Spent ^c
Chapter I (Salaries)				
A. Headquarters		1. Headquarters	10,720	10,720
1. Salaries		2. Rajaf CHW School	8,820	8,820
a. Classified staff	4,455	3. Li Rangu CHW School	8,820	8,820
b. Unclassified staff	2,845	4. Kwajok CHW School	8,820	8,820
SUBTOTAL	7,300	5. Doleib Hill CHW School	8,820	8,820
2. Allowances		6. Marialbai CHW School	8,820	NIL
a. COL	4,885	7. Paidit CHW School	8,820	NIL
b. Overtime	1,000	8. AKOT CHW School	8,820	NIL
c. Travel & Trans.	3,900	9. E. Equatoria PHCP Office	1,110	NIL
SUBTOTAL	9,785	10. W. Equatoria PHCP Office	1,110	NIL
B. Training Schools^a		11. Bahr El Ghazel PHCP Office	1,110	NIL
1. Salaries		12. U. Nile Prov. PHCP Office	1,110	NIL
a. Classified staff	14,420	13. Lakes Prov. PHCP Office	1,110	NIL
b. Unclassified staff ^b	10,330	14. Jonglei PHCP Office	1,110	NIL
SUBTOTAL	24,750			
2. Allowances				
a. COL	16,235			
b. Overtime	1,500			
c. Travel & Trns.	3,000			
SUBTOTAL	20,735			
TOTAL CHAPTER I	62,570	TOTAL CHAPTER II	79,120	46,000
TOTAL RECURRENT EXPENDITURE FOR PHCP			141,590	108,570

Percent of Total MOH Recurrent Budget (Spent)

2.6

- a. Rejaf, Li-Rangu, Doleib Hill, Kwajok, AKOT, Marialbai, Aweil, Bor
 Only the first 4 have been completed; all are budgeted for.
- b. Does not include CHW salaries which are covered by the MOH. Amount is underestimated by 20%.
- c. Items 6-8 have not been built. Items 9-14 have not been built; PHCP staff now operates out of temporary quarters (usually part of a province hospital).
1. Excludes all costs associated with existing PHCUs & dispensaries. Chapter I is included in special grant to provincial councils; Chapter II in the MOH budget.

TABLE 10 (continued)

Activity	D E V E L O P M E N T		Soon to be	
	Approved	Released	Spent	
1. Construction of PHCUs in 6 provinces	467,490	--	--	
2. Construction of dispensaries in 6 provinces	626,180	--	--	
	SUBTOTAL 1,093,670	6,000 ^a	NIL	
3. Renovation of dispensaries in 6 provinces	215,950	NIL	NIL	
4. Construction of 3 CHW schools in 3 provinces	262,380	NIL	NIL	
5. Renovation of 1 CHW school (Gogrial)	--	--	7,000 ^b	
6. PHC drug stores in 6 provinces	115,000	40,000	NIL	
TOTAL DEVELOPMENT EXPENDITURE	1,687,000	46,000	7,000	
Percent of MOH (approved)	51			

a. To supplement self help activities in approved pre-determined areas.

b. Funds not budgeted for but supplied from an internal donor.

C. Social Analysis

This project has been designed to deal with the health problems of the rural poor in Sudan. This social analysis will seek to describe the existing traditional social setting in which the rural and nomad community health workers will operate.

1. Ethnic Groups and Languages

The social matrix of Sudan is marked by ethnic and cultural variety. The four major ethnic and language elements, in varying degrees of mixture, represent semitic, hemitic, nilotic, and Sudanic stocks.

Many languages are spoken in the Sudan, with Arabic predominating in the Northern and Central provinces. Nubian dialects are spoken from Egypt south along the Nile, as well as in the Nuba mountains of Southern Kordofan, and in Darfur to the west. In the east Bedawie languages and Tigre are spoken by Beja hamites and other mixed tribes. Languages of southern Sudan fall into the Nilo-Saharan language family.

For most Sudanese, personal identity is closely related to tribal affiliation. It is only in the present generation of Sudanese that the tribal facial scarifications that proclaim membership in tribes are less frequently being seen.

2. Traditional Health Concepts in the North

In Sudan, as in most traditional societies, ideas of sickness and health, of cause and effect, of religion and the Moral Universe, form one complex system. Within this system, ideally, virtue should lead to well-being, and sin to death, or at any rate illness. To elucidate the Path of Right Action, the Muslim Shari'a (Revealed Law) spells out the spheres of relationship: Self to God, Self to Created Universe, Self to Self.

Islam divides all behavior into five basic categories, "Required", "Recommended", "Neutral", "Disapproved", and "Forbidden." Some things are incumbent (Wajib = Duty) upon all Believers, (the so-called Pillars of Islam), but

many acts and relationships have their limits and obligations spelled out in detail, both for the worldly, and for the mystic spheres of reality.

Individual, social and community virtue are enjoined upon the Muslim. He is to be upright in commerce; honest in his dealings with the widow and the orphan; fair and generous with his servant or slave; correct and firm but generous with his wife and children; equable with the stranger; and rigorous in pursuit of prayer, fasting and attendance at Mosque. He must give alms and he should seek learning "even as far as China!"

In Sudan, one can add to these Muslim ideal values those values of sturdiness, independence, and self-reliance developed by life in the harsh desert environment, as well as the tribal necessities of extensive social support within the narrow limits of the kin-group. Within this ideal system women should be chaste, modest, pious, obedient, infinitely attractive to their lawful husbands and bear uncounted numbers of children.

But there are, nevertheless, areas in this Moral Universe where amoral things exist, from which powers and creatures of another order act upon human beings, sometimes in moral judgment, sometimes in sheer caprice or spite.

In traditional northern Sudanese thought, disease is classified as:

- 1) Mystically caused. This includes:
 - Illness sent by God.
 - Illness inflicted by other people.
 - Illness inflicted by spirits.
- 2) Non-mystically caused and rational (e.g., headache from standing in hot sun).

Traditional healers treat the maladies they are called upon to cure in a variety of ways. They use religion, ritual, magic, materia magica, and materia medica. They also use psychology and rituals to mobilize social support, public opinion and social pressure. Just as western medicine utilizes group-processes therapeutically for psychiatric treatment, Zar parties* provide individual

* Zar parties are group sessions (usually of women) which involve a spiritualist seance in which recognized stock-character spirits animate their "victims" to the ritual accompaniment of drums, songs, and incense. These sessions often provide social therapy, social satire and drama in a ladies "tea-party" setting.

outlets to fantasy, and mobilize social support as emotional backstopping.

3. Traditional Health Concepts in the South

The following folk classifications of sickness and disease causation are recognized in the South:

1) Witchcraft and Sorcery. Witchcraft is something - a substance - inborn in some people, and often in certain families. While witchcraft can affect other people harmfully, the "witch" (male or female) does not necessarily use this quality maliciously. On the other hand, the sorcerer seeks to learn the skills of medicine, divination, and magic so that he/she can deliberately direct them for destructive purposes.

2) Evil Eye. The Muslim quotes the Koran saying "Let the Lord of the Day-Break guard me from the mischief of the envious when he envies..." (Surah 113, v. 1-5). Evil eye is conceived to have a real and tangible power to destroy or produce harm, and it is widely feared.

3) Spirit Possession. While concepts of possessing entities differ slightly from group to group, these are commonly believed in by the Dinka, Nuer, Atwor, Mandari, Muru and other tribes. Celestial spirits are thought to be cosmic spirits-of-the-above, as opposed to spirits-of-earth and below.

4) God's Power. The power of the Creator is conceived as "falling" upon people.

5) Jok. These are dangerous and ambivalent powers which wander free in the universe. They are the powers of what is unuseful to man, untamed, the antithesis of man-and-society. They inhabit the bush, the night, and the spaces between habitations.

6) Ghost Sickness. The wrath of ancestors will cause illness if people breach the norms of social and/or mystical obligation.

7) Sin, Taboo, and Consequent Pollution. Sin is defined as a breach in a social or spiritual obligation. Taboo is, in its simplest definition, the requirement to "respect", or to behave appropriately toward every person, place, object, and institution. Called Thek in Dinka, this concept provides a framework for all behavior, and failure to observe the requirements will bring misfortune or death to people, their relatives, children and cattle.

4. Traditional Healing Methods

Traditional doctors diagnose illness and disease on the basis of physical symptoms determined through external examination and through divination practices which may employ sand-casting, rattles, poison oracles or other impedimenta. Divination and questioning elicit the patient's socio-medical and religious state and history, which are considered the essential elements.

Symptoms are thought to be of secondary importance. Evil-eye and sorcery may cause the symptoms we would associate with heavy worm infestations, or rheumatism, yaws, chronic fever, dysentery, and enteritis. Thus, the layman, lacking mystical and scientific knowledge, is not able to diagnose beyond the level of minor indispositions attributed to natural causes, such as stomach-ache, cuts and bruises, colds, minor diarrhea and constipation.

The bewitched are often listless and become wasted or go mad. Infertility, failure of lactation and death in child-birth are all ascribed to witchcraft, and the witch-caused death is long and slow.

God's power and celestial spirits cause severe headaches, infected eyes, nervous disorders, convulsions, delirium, sore throats, coughs, and pain in the back and chest. Onset is sudden, violent, and death may result from such attacks.

Swelling and other diseases associated with fever which are usually of sudden onset and often fatal are thought to be caused by Jok, while angry ancestral ghosts may induce female infertility, illness in children, and failure of wounds to heal.

Sin and pollution bring infertility in women, male sterility, and death to children. Thek-breach has the nature of a public-health problem because of its contagious quality. Epidemics (e.g., measles, meningitis) are thought to be the visitation of God's power.

Psycho-social and physical illness are not clearly differentiated in this schema. All are treated by Shaman doctors who acquire medical skill through surviving serious misfortune, disease or emotional disorder themselves. Thereafter they may receive training from practicing professionals who will sell them the medicines and the power to control spirits and Jok. Control of a spirit-ally

enables the doctor to diagnose and treat other people for all of the above mentioned diseases.

There are other categories of traditional practitioners such as bone-setters, midwives, and "owners" of specific herbs. Bone-setters splint and poultice fractures, sprains and swellings, and often use massage as well. Midwives usually are older women who assist pregnant mothers within their own lineages. Medicine "owners" will know one or a few herbs, or roots, fruit and bark that can be used to treat colds, wounds, snake-bite or sore-eyes.

By and large, the people of the rural Southern Region of Sudan see their form of medicine as peculiarly suited to their way of life and to their relationship with the moral universe. They generally prefer to treat illness by their own methods; but they recognize different modes of therapeutic practice as valid. Just as they may borrow certain ritual practices from other nearby groups, ideas of modern medicine gradually make their entry into their lives, and some are slowly assimilated. They see a common human element between the two healing systems. They also recognize areas of overlap where folk medicine and scientific medicine may exist side-by-side without conflict, at some points complementing each other.

It is in this context of a multitude of practitioners dealing with disease induced by a variety of spiritual, scientific, religious and other causes that the CHW and NCHW will operate. It can thus be seen that the success of the PHCP will depend to a great degree on the capability, motivation, energy, and acceptance of the individual CHW or NCHW.

5. Role of Women

The participation of women in the work force is low - about 9% in urban areas, and probably about 10% in rural areas. Official statistics on employed women vary from 2% to 56%, according to varying definitions of "productive activities".

In the PHCP, there are several job categories that could potentially be filled by women. The CHWs immediately come to mind. Unfortunately, at present there are only a few women CHWs in the North, and none in the South. Several explanations are given for this:

- some community health activities of the CHWs, such as directing housing refuse disposal efforts, excreta disposal projects and control of vectors are not suitable for women;
- the traditional role of women has not permitted them to move easily into community leadership roles;
- distances that must be travelled, especially in the South, preclude safe movement by women, especially at night;
- the mature women needed for the CHW positions are usually married, and their family responsibilities make it difficult for them to work full time;
- few women apply for consideration as CHWs. In the South the only woman candidate failed to pass the written examination required of the CHWs.

Despite these problems, many of the activities performed by the CHWs are appropriately suited to women. These include:

- inspection of schools and treatment of school children,
- health education talks to families,
- nutrition education
- pre and post natal visits to mothers,
- assistance to midwives
- participation in immunization campaigns.

MOH officials in both the North and the South are concerned about the low level of participation in the program by women. While there is awareness of the problem, however, few steps are being taken to improve this situation. One encouraging development noted in the Kordofan area is the fact that the current group of CHWs under training contains four women.

6. Involvement of Beneficiaries

A key element in the entire PHCP is the involvement of the community. From the very inception of the program, community representatives had a role in drafting the PHC plan. As part of this effort, questionnaires and studies were performed to identify community attitudes and needs (e.g., nomad studies).

The cornerstone of the PHCP is the Community Health Worker. He/she will be selected by the community through the three institutions of the community:

- Village Development Committee
- SSU Basic Unit Committee
- Village Councils.

The selection process is supervised by the District Medical Inspector and the Executive Officer of the Rural Council, with participation of a CHW tutor.

Another element involves community self-help. This factor has been described in Part II-A.

D. Economic Analysis

The economic analysis will attempt to show that there are advantages to providing health delivery services to the rural poor. The principal economic benefits generated by this project are the development of human capital, the increased mobilization and productivity of human, financial and natural resources, and a more socially efficient and equitable allocation of resources. Indirect benefits flow from new approaches to traditional agriculture (to improve elements of basic nutrition), the development of a reliable transport system (and other infrastructure), greater absorptive capacity, and improved access to safe water and waste disposal.

For a project of this nature, cost/benefit or NPV analysis cannot be used in any meaningful manner as an identifiable income stream is not generated. Likewise the IRR of the project cannot be determined. The issue here, however, is that of selecting the most appropriate project design rather than making a choice between various project alternatives.

Any project design will contain an element of risk, which again cannot be meaningfully quantified. However, over a 3-year period, costs associated with the project inputs (in terms of recurrent expenditure) are very low vis-a-vis overall GOS financial commitments to the health sector. As investment levels are reasonable and associated costs manageable, the risk factor is minimized.

To maximize the cost/effectiveness of AID inputs, an overall view of the current status and needs of the PHCP was taken. It was determined that capital expenditure should concentrate on areas with the quickest return. Training schools were therefore ruled out as being too costly and involving a considerable lag time before use. Less costly alternatives were found to achieve the same end (i.e., using nursing school classrooms to train CHWs and their tutors during off hours). The construction of PHCUs and the increasing use of Nomad CHWs were deemed the most cost/effective way of delivering preventative and promotive care to the rural areas. The location and number of PHCUs to be built (35) as well as Nomad CHWs to be equipped (600) were determined by projecting over the next 3 years the shortfall in areas of highest poverty. Need for the more costly dispensaries was judged to be not as critical. The GOS can supply capital inputs to meet required construction.

In addition, printing of data forms was determined to be the quickest, least costly method of gearing up an already existing data and information system.

The benefits associated with the technical assistance to be provided by AID were seen as interconnected and mutually supportive. Headway achieved in the management/planning side of the MOH/PHCP would enhance the activities of the Logistics/Supply expert. These activities in turn would insure the efficient use of vehicles to be supplied by AID. Establishing a viable data and information system would determine where the PHCP management level should focus its attention.

Participant and in-country training including the refresher and reorientation courses for the numerous health personnel engaged in the PHCP would further enhance the achievement of rural health care delivery goals. At the same time, training would insure the most efficient and cost effective use of rural health resources and superstructure (such as the capital components to be supplied by AID). The costs of training are minor compared to the benefits that would flow from income and employment generation as the quantity and quality of the Sudanese people working in the health sector expand.

Indirect benefits would eventually result from the anticipated improvements in program coverage and effectiveness which can be directly attributed to project trained personnel. Similarly, the planned capital construction would directly effect efficiency and resource utilization plus generate employment and income in the form of increased local manpower usage.

Thus, the project design, geared to the ability of the GOS to absorb inputs and support associated costs, has favorable economic implications. In addition, the inherent flexibility of the project is sufficient to allow room for maneuver after periodic review. As the economy expands and infrastructure strengthens, the scope of AID inputs can grow accordingly.

AID inputs and project outputs are summarized in Part II B.

PART 4: IMPLEMENTATION ARRANGEMENTS

A. Analysis of the Recipient's and AID's Administrative Arrangements

1. Recipient

a. Organization and function

The Ministry of Health is the agency responsible for all health affairs of the Government of Sudan. It is responsible for implementing the PHCP and integrating AID's assistance into the program. The MOH is headed by a non-technical, politically appointed cabinet-level Minister. The Chief Medical Officer and the individual responsible for day-to-day operation/administration of the MOH is a physician civil servant with the title of "Under-secretary of MOH".

The MOH has six (6) major operating departments:

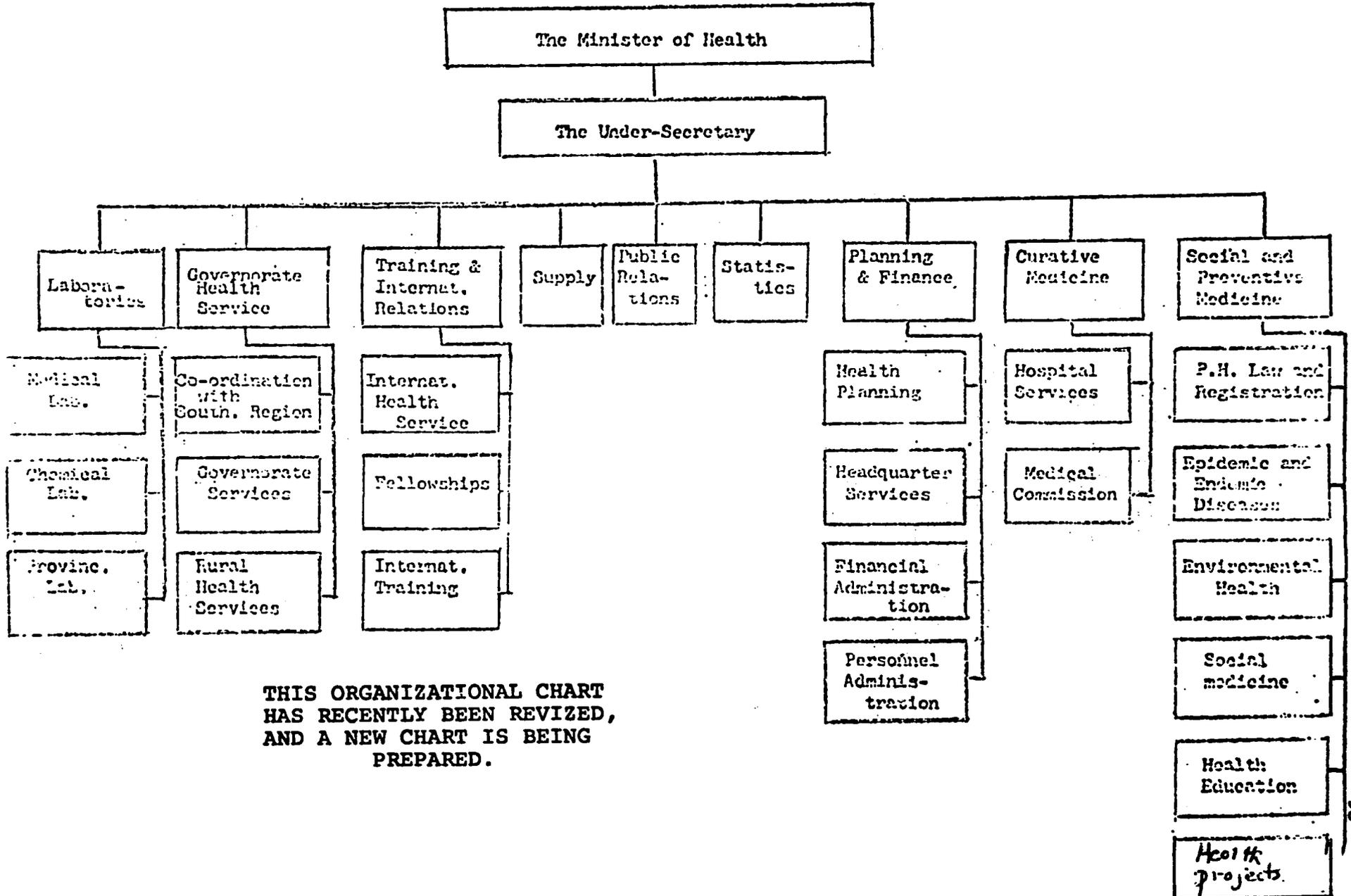
- 1) Health Planning and Budgeting;
- 2) Rural Health Services;
- 3) Curative Health Services;
- 4) Social and Community Health Services;
- 5) International Health and Training; and
- 6) Central Laboratories (See Chart IV-1).

Many of the functions of the MOH are decentralized or delegated to the provinces, particularly the administration of health services programs. (See Chart IV-2) Activities which have not been delegated to the provinces include:

- National Health Planning;
- National Manpower Training Programs;
- National Medical Stores and Central Laboratories;
- Health and Vital Statistics Data System;
- International Health; and
- Capital Construction and Health Program Development.

The Chief Medical Officer at the Provincial level is the Assistant Commissioner of Health. This individual is responsible for administering all health activities and programs in each of the provinces. The provinces are

CHART IV - I



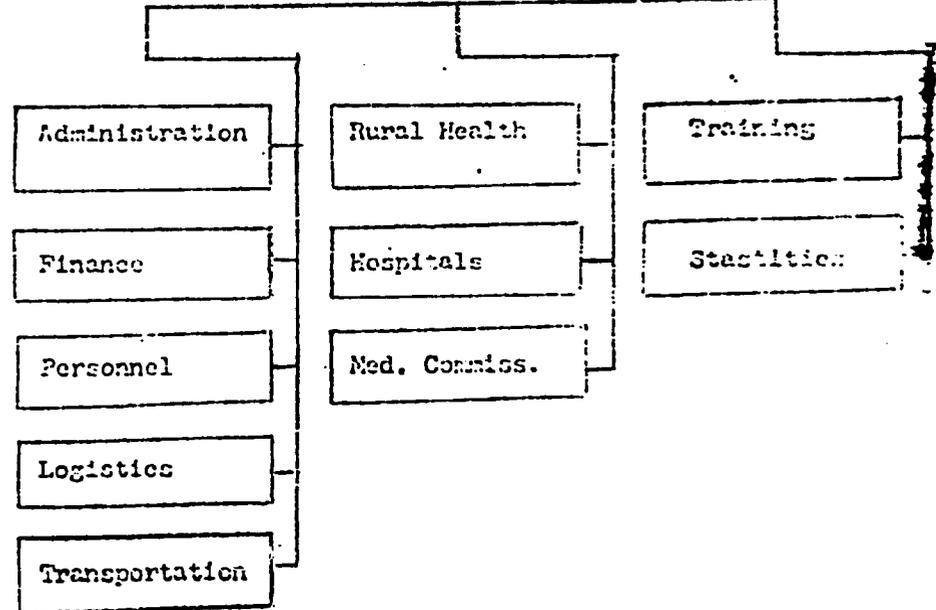
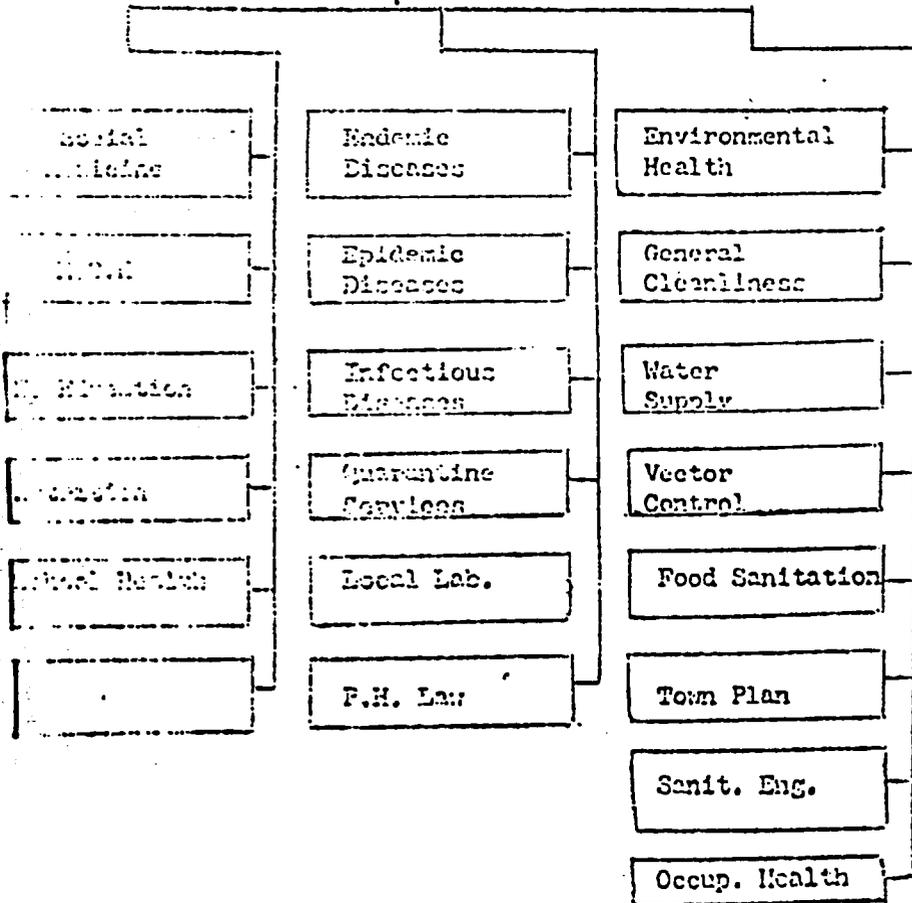
THIS ORGANIZATIONAL CHART HAS RECENTLY BEEN REVIZED, AND A NEW CHART IS BEING PREPARED.

CHART IV - 2

Deputy Governor
for Health Services

Assistant Governor for
Health
Prevent. & Social Med.

Assistant Governor for
Health
Curative Services



THIS ORGANIZATIONAL CHART
HAS RECENTLY BEEN REVIZED,
AND A NEW CHART IS BEING
PREPARED.

further divided into districts, the latter having a Chief Medical Inspector serving as the head of health services in the district. These individuals are responsible to their respective Assistant Commissioners for Health.

b. Southern Region - Special Relationships

The Southern Regional Ministry of Health is responsible for all health activities in the Region except for those functions not delegated by the central MOH. The Southern Region, consisting of 6 provinces, is headed by a Minister of Health who is a physician. The Minister of Health for the Southern Region has the same authority and responsibilities in the South as the Minister of Health for Khartoum and Northern Regions. The provincial organizational structure, functions and operations in the Southern Region are similar to those in the Northern Regions.

The only direct AID input to the Southern Region included in this PP is some short term technical assistance which will be integrated into the PHCP through the Minister of Health for the South. AID support to the PHCP in the South will be channeled through the African Medical and Research Foundation (AMRF). This latter assistance project will be supervised by the MOH for the Southern Region (See Part 2).

c. MOH Infrastructure and Absorptive Capability

Management capabilities vary considerably from North to South. The Ministry of Health serving the Northern Region is staffed in some depth in each of the major program areas. In contrast, the Ministry of Health for the Southern Region has only four professional staff at the director level, so that each director is responsible for more than one major program area. The technical divisions are comparatively well staffed in the north whereas only a handful of trained technicians exist in the south.

The Ministry of Health for the Northern Region is in a more favorable position to receive and absorb external assistance than the South because it has a more adequate administrative structure. There still remains, however, the need to strengthen MOH skills in program implementation to ensure continued program expansion. The traditional approach to categorical (or vertical) programs will need redirection to focus on comprehensive (or horizontal) programs for the broad spectrum services of the Primary Health Care Program. The shift in emphasis from curative to promotive and preventive services at the community level will demand greater coordination between

health program components to assure proper balance in the use of limited resources.

Furthermore, in the past, program direction has tended to flow downward from Khartoum. This has been the practice for such national programs as maternal and child health, communicable disease control and childhood immunization, development of water supplies, and control of major endemic diseases - malaria, onchocerciasis, and schistosomiasis.

With the introduction of the Primary Health Care Program, responsibility for operational direction will shift from national or regional to provincial and local levels. Many of the preventive health services previously provided in special national programs, such as the smallpox immunization campaign, will become regular services at the PHC complex. Even in national programs, such as endemic disease control, many preventive and treatment services can be rendered by PHC units.

The emphasis of this AID project will be to assist the MOH in the Northern Region to coordinate and integrate its categorical programs, and at the same time, to help accelerate the expansion of the PHCP.

The infrastructure and absorptive capability of the MOH in the South is considerably different than in the North. Government agencies in the South have the difficult task of rebuilding organizations shattered by 17 years of civil war. The Ministry of Health has its development plan for the PHCP, but not the personnel to make the plan operational. Thus, to alleviate the shortage of trained staff in Juba, the MOH needs technical assistance to fill operational slots until Sudanese staff can be recruited and trained to replace them.

To respond to this special need, AID is planning to fund a separate PHCP support project for the South through a private voluntary organization, the AMRF. That project will provide among other elements, seven long term technical consultants to perform MOH staff functions and to help recruit and train counterpart technicians.

d. MOH Supportive services

The lack of infrastructure for supportive services, such as logistics/supplies, and data collection/

health statistics poses a critical problem for the expansion of rural health services. Success of the Primary Health Care Program will require appropriate strengthening of these support services. As a result, long term technical assistance in logistics/supply and health statistics will be provided through this project to the MOH in the North, and through the AMRF project to the MOH in the South.

e. MOH Coordination

Because the two Ministries of Health function as semi-autonomous institutions, problems of communication and coordination bear adversely on the development of an integrated PHCP. For political, socio-economic and cultural reasons, the Southern Region will continue along the present administrative lines. However, there is a need to develop and implement an integrated health data and management information system. This would include the use of identical data collection instruments, joint reporting, exchange of health data, and regularly scheduled meetings to share planning and operational experiences. While a single data collection system is planned, and a series of data collection forms have been pretested and approved, some differences exist to be resolved primarily in the area of the amount of information to be gathered by the CHW.

f. MOH Ability to Administer Contracts/Grants

The MOH has demonstrated a high degree of responsibility and cooperation in dealing with foreign groups that are providing technical and other assistance to its PHCP. Two outstanding examples are:

- the development of a National Health Care Program and the PHCP in cooperation with WHO.
- the development and training of CHW tutors and community health workers in the South in cooperation with the AMRF.

Thus it is anticipated that both the Northern and Southern MOHs will continue to have a positive attitude towards foreign donor assistance in all forms. The MOHs' have adequately demonstrated their capability to deal with grants and contracts.

g. Administrative Arrangements to Reach and Involve the Target Populations

The PHCP was designed with input from community organizations. Further, the CHWs and NCHWs themselves will be selected by the communities in which they will work. In addition, community self-help has been an important force in the development of the PHCP. Most importantly, however, is the fact that the whole thrust of the program is aimed at bringing health services to the rural/nomad poor.

2. A.I.D.

While this project is complex, a number of special features will permit USAID/Sudan to supervise and monitor this effort. These include:

- an excellent spirit of cooperation exists between AID/W, USAID/Sudan and MOH personnel at all levels.
- a performance report will be required of each administrator, contractor, or PASA Chief-of-party, or hired consultant for the particular aspect of the project with which they are involved.
- concurrent examinations and reviews will be conducted with other participating agencies, governments and institutional representatives (e.g. WHO).
- evaluation reviews on an annual basis of each aspect of the project will be conducted by USAID/Sudan, REDSO/Nairobi and AID/W representatives together with GOS MOH staff.
- evaluation follow-up studies will be performed every three years by the MOH Department of Statistics in those villages for which baseline data have already been collected in 1976.
- baseline and follow-up studies at the village level in the North and South will be performed by the MOH in 1978 and 1980 through IDRC support.
- periodic field checking and observation will be conducted by USAID/Sudan, REDSO/Nairobi and AID/W staff.
- performance evaluation of all construction under this project will be performed jointly by MOH officials and a REDSO/Nairobi engineer.

At this time, USAID/Sudan does not anticipate that it will require any additional technical staff to monitor the grantee, contractor, or PASA group selected to implement this project. Day-to-day supervision of the project, as needed, will be performed by USAID/Sudan program staff who will be arriving in Sudan shortly.

Some aspects of the project may require short term consultants in highly specialized fields (e.g., health facilities architectural design). These persons may be available through AID/W, through PASA agreements with other U.S. government agencies or through private consultanting firms.

B. IMPLEMENTATION PLAN*

<u>ACTION</u>	<u>DATE</u>	<u>AGENT</u>
1. PP submitted to AID/W	6/78	USAID/S
2. PP Approval	6/78	AID/W
3. PROAG Signed	7/78	USAID/S, GOS
4. PIO/T Issued	7/78	USAID/S, AID/W
5. RFP Published	8/78	AID/W
6. Proposals Received	10/78	AID/W
7. Contractor Selection	11/78	AID/W, USAID/S, GOS
8. Contract Signed	12/78	AID/W
9. Vehicles (25), Photocopy Machine ordered	1/79	USAID/S, Contractor
10. Schedule/Sites for 40 orientation courses selected	1/79	GOS
11. Schedule/sites for 10 CHW Refresher courses selected	1/79	GOS
12. Long-term advisors arrive	1/79	Contractor
13. Identification of 12 3rd country participants	6/79	GOS
14. Equipment/instruments/drugs/supplies ordered for 320 Nomad CHWs	6/79	GOS, USAID/S, Contractor
15. 2nd Vehicle order placed (25)	6/79	USAID/S, Contractor
16. Printing of data forms	6/79	GOS

*(This is to be considered as a preliminary implementation schedule. A detailed implementation plan for each project activity will be required of the contractor 3 months after arrival at post.)

<u>ACTION</u>	<u>DATE</u>	<u>AGENT</u>
17. Construction sites selected for 23 PHCUs	6/79	GOS, USAID/S
18. Short-term advisors (U.S.) identified and scheduled	6/79	GOS/Contractor/ USAID/S
19. 3 long-term U.S. participants identified	6/79	GOS
20. Equipment/instruments/drugs/supplies ordered for 130 Nomad CHWs and 23 PHCUs	7/79	GOS/USAID/S Contractor
21. Construction supplies ordered, 23 PHCUs	7/79	GOS, USAID/S Contractor
22. Identification of 6 short-term participants - U.S.	7/79	GOS
23. Construction of first PHCUs begins	8/79	GOS/Local Contractor
24. Schedule/sites for 40 reorientation courses selected - 2nd year program	1/80	GOS
25. Schedule/sites for 10 CHW Refresher courses selected - 2nd year program	1/80	GOS
26. Identification of 12 3rd country participants - 2nd year group	6/80	GOS
27. Identification of 6 short-term participants, U.S. - 2nd group	6/80	GOS
28. Construction sites selected for 12 remaining PHCUs	6/80	GOS
29. Construction supplies ordered - 12 PHCUs	6/80	GOS, USAID/S, Contractor
30. Equipment/instruments/drugs/supplies ordered for 150 Nomad CHWs and 12 PHCUs	7/80	GOS, USAID/S, Contractor

<u>ACTION</u>	<u>DATE</u>	<u>AGENT</u>
31. Construction of 12 remaining PHCUs begins	12/80	GOS/Local Contractors
32. Schedule sites for 8 remaining CHW refresher courses selected - 3rd year program	1/81	GOS
33. Schedule/sites for 23 remaining reorientation courses selected - 3rd year program	1/81	GOS
34. Identification of 12 3rd country participants - 3rd year group	1/81	GOS
35. Long term technician reports submitted to USAID/S	1/81	Contractor
36. Evaluation team arrives	2/81	AID/W, USAID/S
37. Phase II PP Developed	5/81	USAID/S
38. Long term advisors depart	1/82	Contractor

C. Evaluation Plan

USAID/Khartoum recognizes that the concept of health care provided at the village level by a lower level para-professional worker (CHW) is relative new. As such, this carries some risk. On the basis of factors previously described (e.g., comprehensive preplanning, significant accomplishments to date, self-help activities, community involvement), USAID/Khartoum feels that there is strong evidence to support a significant AID commitment to the Sudanese health sector at this time.

To ensure that the PHCP continues to expand and that AID inputs actually play a critical role in that expansion, USAID/Khartoum will rely heavily upon periodic project and program evaluations.

As noted previously, the GOS has already performed baseline surveys and will conduct follow-up studies at 2-3 year intervals. These data will be made available to USAID/Khartoum for review and assessment.

In addition, two AID project evaluations are scheduled:

- an interim evaluation at month 24,
- a final evaluation at month 36.

1. Interim Evaluation

This evaluation will address progress in output level accomplishments at the central and northern regional level. The planned outputs are contained in the project logical framework in Part 2-B.

The output level analysis will concern itself with the four key elements of this project:

- training/reorientation/refresher courses for CHWs, NCHWs and their supervision,
- construction of PHCUs,
- development of a functioning logistics supply system,
- implementation of a health data and management information system.

An additional important element of the evaluation will involve assessment of CHW community promotive and preventive activities. These will include such efforts as vector control work, health education talks and immunization team activities.

Month 24 has been selected as the most logical point for this evaluation as a significant number of CHWs and NCHWs should have been trained and posted, and PCHUs built. The accompanying logistics/supply and health data systems should also have begun operations.

Of great assistance to this evaluation effort will be the fact that PHCP pre-implementation baseline studies have already been performed by the GOS. The first follow-up studies will have been conducted, and the results will be available to the AID evaluation effort.

On the basis of this interim evaluation, modification in the third year of this project can be made. Further, if warranted, more detailed project design efforts can begin on the continuation of this project beyond the initial three year funding period.

The interim evaluation of the project at month 24 will be conducted with the participation of:

- USAID/Khartoum
- REDSO/Nairobi
- GOS/MOH
- outside professional experts (3) in the field of LDC rural health systems.

2. Final Evaluation

In the event that the interim evaluation results indicate that sufficient progress is being made in the project, USAID/Khartoum, AID/W and the GOS may wish to extend the initial 3 year life of this project. In this case, the final evaluation of the project would be postponed until the end of the revised project period.

If the interim evaluation results at month 24 indicate that program deficiencies exist, the contractor and the GOS will be given 12 months to show an improvement in project performance. If the deficiencies are not corrected, the final evaluation will take place at month 36 of the project.

In either case, the final evaluation will focus on:

- institutional and systems accomplishments during the life of the project, reflecting progress since the interim evaluation,
- an impact analysis of the entire network and its effect on the delivery of health care to the poor in Northern Sudan.

The impact analysis will measure achievements at the purpose and goal level through use of the objectively verifiable indicators included in the project logical framework.

It may be possible to perform additional impact analyses of certain baseline vital statistics data such as infant mortality and death rates. These analyses will depend on the completeness of a planned baseline study to be conducted in the North and South with the assistance of IDRC. This baseline study is scheduled to be conducted in 1978 and be repeated again 20 months later.

D. Conditions, Covenants and Negotiating Status

1. USAID/Khartoum and the GOS will agree on the design and specifications for each facility (PHCU, and/or dispensary) to be constructed or renovated.
2. USAID/Khartoum and the GOS will agree on the total fixed amount required to build the above facilities, or a percentage of the fixed amount in case actual estimated costs are exceeded.
3. USAID/Khartoum and the GOS will agree on the sites or locations of the above facilities with preference being given to the provinces of North and South Darfur, and North and South Kordofan.
4. The GOS will agree to underwrite the recurrent costs for the facilities built with USAID assistance. Recurrent supply and equipment costs will also be provided by the GOS.
5. The GOS will provide counterpart personnel to work with the long-term U.S. technical advisors. These personnel will have appropriate background, training and experience so as to maximize their counterpart training experience.

6. The GOS will provide adequate office space for the U.S. long-term technical advisors, as well as secretarial support.
7. The GOS will provide maintenance and gasoline for all USAID supplied vehicles.