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HELEN KELLER INTERNATIONAL

FINAL ACTIVITIES REPORT

Nutritional Blindness Prevention
Control Program for Drought Victims in Sudan

Helen Keller International

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TABLE OF CONTENTS

	Page
Map	
Glossary	ii
Executive Summary.....	1
Introduction	3
Background.....	3
I. Project Design Summary.....	4
a. Country Project Objectives.....	4
b. Priority Population.....	6
c. High Risk Groups.....	8
d. Child Survival Interventions.....	8
e. Improvements in Program Quality.....	15
II. Linkages to Community, Government and NGO Health Activities.....	16
III. Human Resources and Technical Support.....	16
IV. Project Health Information Systems.....	17
a. Baseline Survey.....	18
b. Monitoring System.....	19
c. Final Evaluation.....	23
V. Work Plan and Constraints.....	25
VI. Project Expenditures and Budget Revision.....	27
Bibliography.....	28

ANNEXES

1. Vitamin A prevalence Survey, North Darfur
2. Population and PVO responsible for refugee camps in Eastern Sudan
3. Job description and role of project staff
4. Final Evaluation
5. Vitamin A support program (Red Sea Province)
6. List of educational materials developed by the project
7. Report on National Vitamin A workshop

GLOSSARY

ARI	Acute Respiratory Infection
COR	Commission Office for Refugee
HKI	Helen Keller International, Incorporated
IU	International Unit
IVACG	International Vitamin A Consultative Group
JNSP	Joint Nutrition Support Project (Joint WHO/UNICEF Nutrition Program)
MCH	Maternal and Child Health
MOH	Ministry of Health
NGO	Non-Governmental Organization
PHC	Primary Health Care
PVO	Private Voluntary Organization
RTH	Road to Health cards
UNHCR	United Nations High Commission for Refugee
USAID/KRT	United States Agency for International Development in Khartoum
VAC	Vitamin A Capsules
VAD	Vitamin A Deficiency
VHW	Village Health Worker

EXECUTIVE SUMMARY

The Nutritional Blindness Prevention/Control Program for Drought Victims in Sudan began during September 1987. The project was originally for two years but has undergone two extensions. It is scheduled to end February 28, 1990. The main goal was to prevent and treat nutritional blindness among children in North Darfur and Red Sea Provinces, and children of Ethiopia refugees.

The project targeted high risk groups. These are children (1) below the 5th percentile of weight for height, (2) with measles, (3) with chronic diarrhea. High risk children identified by the health workers of PHC units, health centers and rural hospitals are given the treatment dosage of vitamin A.

Throughout the life of the project, several measures were taken to improve the quality of programming, information gathering, and knowledge of project staff and MOH counterparts. In addition to training programs, this was accomplished mainly through meetings, conferences, and seminars.

The project established strong and extensive linkages with the Ministry of Health on the national and local levels and the PVO community. The program is implemented in refugee camps by PVO health personnel as part of an integrated refugee health care program.

The project employs one expatriate Country Director, one locally-hired Project Administrator, one Driver and one Secretary. From the Nutrition Department, Ministry of Health/Khartoum, three Nutrition Officers seconded to the project staff continue to work with HKI. The Director, Nutrition Department works as a counterpart of HKI's Country Director.

In Darfur, the regional team consists of a Program Coordinator and three Medical Ophthalmic Assistants. The Director General of Health, Darfur region, has primary responsibility for project activities. A similar structure has been established in Red Sea Province with the Directorate of Health/Port Sudan.

HKI/Sudan receives continuous support from HKI Headquarters. The Country Director reports to the Manager of the Africa Region who is a public health specialist. Special experts in training, educational materials development, vitamin A related issues, monitoring, and evaluation are available at Headquarters.

In February/March 1988, a vitamin A deficiency prevalence survey was conducted in North Darfur. A realistic monitoring system must take into consideration the capacity of the government health system to collect and analyze data. In recognizing that the recording and reporting of important health information within this system is limited, the project instituted a simple monitoring mechanism focusing on minimal data requirements for tracking the vitamin A activities.

In November/December 1990, HKI assisted the Department of Nutrition and provincial health authorities in a vitamin A deficiency prevalence survey in Red Sea Province. The survey examined 200 children under six years of age in each of 10 sites, 4 urban and 6 rural. Data are being analyzed in Khartoum.

The First National Vitamin A Workshop was held from December 4 to 7, 1989 in the Grand Hotel conference room in Khartoum. Its purpose was to bring together representatives from all organizations and agencies working to reduce vitamin A deficiency in Sudan to update them on current activities and national plans.

As USAID is closing its office in March 1990 and curtailing all but relief activities, HKI assisted the Department of Nutrition in the preparation of proposals to UNICEF for continued activities. UNICEF is being asked to support a "Vitamin A Unit" within the Department of Nutrition which would continue to provide technical assistance in training health personnel in vitamin A deficiency control activities. HKI hopes to continue to provide assistance to the Vitamin A Unit, upon request, through this mechanism. Assistance to U.S. PVOs active is pending AID clearance, through HKI's VITAP (Vitamin A Technical Assistance) program.

INTRODUCTION

This is the third annual report for an extended two year high impact program entitled "Nutritional Blindness Prevention Control Program for drought victims in Sudan." The project started in September, 1986 and was to have been completed on August 31, 1986. Two no-cost extensions have been awarded to HKI.

The project's aim was to distribute vitamin A capsules in the refugee camps and drought affected areas in Sudan. This was accomplished via training of the Ministry of Health service providers and the local and international staff of private voluntary organizations.

This program was ambitious in the conception and goals it set out to achieve--appropriate at the time of project proposal submission to USAID for funding in early 1986. From mid-1986 onwards, the country saw many changes which so altered the prevailing conditions in the country that it became necessary to scale down the scope of the project, both in operational areas and number of activities.

BACKGROUND

The current program was developed as a result of HKI's work with refugee populations in Sudan since early 1985, under a grant from USAID's Office of Foreign Disaster Assistance. Under this grant, HKI provided vitamin A capsules to UNHCR and COR (Commissioner's Office for Refugees) for distribution in refugee camps and settlements; provided training materials and conducted training seminars to PVO international and local health staff. This was preceded by a rapid assessment survey for xerophthalmia in selected refugee camps. The Eastern refugee camps showed prevalence levels of vitamin A deficiency far in excess of WHO minimum prevalence criteria. All through 1985, to the beginning of 1986, HKI consultants visited the refugee camps for the purpose of monitoring and training. Thanks to these efforts and the cooperation with UNHCR, COR and PVOs, vitamin A prophylaxis every 3 months to all children under 15 was incorporated into the general health care activities of those camps.

During this initial work in Sudan, HKI teams were working as consultants through UNHCR and COR. This required neither an established office or a license to operate as a PVO in Sudan.

During these HKI missions (June 1985, September 1985, February 1986), extensive discussions were conducted with the Sudanese Ministry of Health, USAID, and COR to develop a vitamin A intervention program in drought-affected areas of Sudan. Three regions were identified as having a need for vitamin A activities: Darfur, Kordofan, and Red Sea provinces. These regions were severely affected by the drought with much displacement of people from their villages. The assumption was that most of the at-risk population groups could be reached through the then existing famine relief infrastructure, namely at displaced people camps, feeding centers, food distribution points and other accessible population groups.

The proposal for the current program was submitted in its final form in March of 1986 after several revisions in consultation with USAID/KRT. Funding for the project was made available in September 1986.

I. PROJECT DESIGN SUMMARY

A. Statement of Country Project Objectives

The main aim of the program was the delivery of vitamin A capsules (for the prevention and treatment of nutritional blindness) to children of the population groups mentioned above. In the refugee camps, HKI worked with health personnel affiliated with UNHCR, PVOs active in relief work, and the Sudanese Commission of Refugees and the Sudanese Relief and Rehabilitation Commission. In Darfur Province, HKI integrated its activities with those of USAID's Rural Health Support Project which works in collaboration with provincial health authorities, UNICEF, and other PVOs. Kordofan and the Red Sea province were secondarily included for technical assistance to PVOs and regional health departments in their efforts to address the problem of vitamin A deficiency.

Beginning in 1985 and then through mid-1986, HKI established regular vitamin A supplementation (treatment and prophylaxis) in the refugee camps and settlements in the Eastern region of Sudan. As already mentioned, this program was coordinated through UNHCR and COR, implemented through various relief agencies operating in the region. HKI was able to integrate vitamin A activities into the framework of general refugee health care. These activities continue.

The success was influenced by the extensive network of relief services at that time. The 1983/84 drought had a devastating effect over large areas of Western, Northern and Eastern regions of Sudan resulting in mass starvation and dislocation of people. As a result, international

agencies--in collaboration with the Sudanese government--set up a massive famine-relief infrastructure in the affected areas to provide food and medical care. Despite the enormous logistic difficulties of bringing these services to where they were needed, a good infrastructure was laid down, with relief agencies providing health care, running supplementary feeding programs and food grain distribution programs. The largest operations were undertaken by Save the Children (UK) in Darfur region, CARE in Kordofan region, and World Food Program (WFP) in the Eastern region. Besides these, numerous smaller PVOs were running health and feeding programs throughout the drought-affected regions of Sudan.

HKI proposed to take advantage of this famine relief infrastructure in addressing the problem of vitamin A deficiency in such a large geographical area of Sudan, namely Darfur, Kordofan and Eastern regions. When these infrastructures changed and/or dismantled in 1987, HKI was forced to change its project objectives and plan of operation.

The primary geographic focus of the program was reduced to Darfur region (Sudanese nationals and Chadian refugees) and Eastern region (Ethiopian refugees). In Darfur region, in consultation with USAID, it was planned that HKI would integrate its activities with the USAID-supported Rural Health Support Program (RHSP) and the Ministry of Health, Nutrition Department. By working through the Department of Nutrition, HKI hoped to institutionalize vitamin A activities. The refugee program was basically to continue as it was, with the added components of monitoring and training.

Project objectives were:

1. To conduct a baseline assessment survey in North Darfur.
2. To reduce the prevalence of vitamin A deficiency in the target populations.
3. To deliver VAC to government and non-governmental agencies in program areas for distribution. Design an efficient distribution system to all health facilities in project areas.
4. To train peripheral health workers in the detection, treatment, and prevention of xerophthalmia.

5. To put in place a simple recording and reporting systems for the monitoring of VAC use in project areas.
6. To increase awareness of the problem in the public and the government health system.

Targets include: 1. VAC Coverage

- Over 90% coverage with VAC in refugee camps
- Over 50% coverage with VAC in N. Darfur in the first year of mass dosing
- Over 90% of all health facilities in North Darfur will have adequate and timely supplies of VAC
- 100% of the refugee camps/settlements in Eastern Sudan will have adequate and timely supplies of VAC

2. Training

- Over 90% of the community health workers, medical assistants and midwives will be trained
- Over 90% of the refugee health workers will attend at least one training session

B. Estimates of the Size of the Priority Population in the Child Survival Impact Areas

During the first year of the project, children under 15 years of age were targeted for the vitamin A program in refugee camps; children under 6 years were targeted in the non-refugee population. Pregnant and lactating women were monitored, since the assessment data also demonstrated vitamin A deficiency in this group.

Three distinct population groups were originally targeted for the program.

1. Refugees, both Ethiopian (in Eastern Sudan) and Chadians (in Western Sudan)
2. Displaced people camps (Sudanese) in drought-affected areas
3. Sudanese nationals living in the drought-affected province of N. Darfur, and,

secondarily, in Red Sea and Kordofan Provinces.

However, by the end of 1986, all displaced Sudanese peoples camps in Darfur, Kordofan and Red Sea province and refugee camps for Chadians were closed. Therefore, it became necessary to drop these categories of population-- displaced peoples camps (Sudanese) and Chadian refugees -- from the target population.

The population breakdown of the Darfur region and refugees is defined in the following tables.

TABLE I
POPULATION BREAKDOWN, DARFUR REGION

Region	Province	1983*	1987**
Darfur	N.Darfur	1,327,947	1,535,526
* 1983 census		** Projected	

TABLE II
POPULATION BREAKDOWN, REFUGEES*

Ethiopian	232,800 (directly being assisted)
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Source: UNHCR (1986)

TABLE III
POPULATION BY AGE GROUPS

Province	Under 1 year	Under 5 years	Under 15 years
N. Darfur	61,421	230,328	537,434
*Estimates (Projected, 1987)			

TABLE IV
REFUGEE POPULATION BY AGE GROUP*

Refugees	Under 1 year	Under 5 years	Under 15 years
Ethiopian	8,290	18,860*	72,537
*Source: UNHCR (Estimates)			

During 1988 another distinct population group was added to the project:

Displaced Sudanese populations living in the "unplanned" areas of the National Capital. This group was included as a result of the August flood emergency (1988) which compounded the already marginal nutritional status of the population.

C. Strategies For Identifying and Providing Follow-up Service to "High Risk" Groups

The project targeted high risk groups as follow:

- Children below the 5th percentile of weight for height
- Children with measles
- Children with chronic diarrhea

Once those children are identified by the health workers of PHC units, health centers and rural hospitals, they are given a treatment dosage. It consists of 1 megadose (200,000 I.U.) of vitamin A capsule by mouth immediately upon diagnosis, with repeat dosage the following day and additional dose 1-2 weeks later to boost liver reserves. Due to the high frequency of diarrheal episodes, the project recommended only 1 vitamin A capsule to children with chronic diarrhea. The project encourages follow up service for malnourished children.

D. Child Survival Interventions

The Sudan project has two components because of the nature of the population groups served by the program:

1. the "Refugees" and
2. the "Sudanese nationals".

There is a separate government agency, the "Commissioner's Office for Refugees" that administers all refugee programs with funding assistance from UNHCR and "implementation agreements" with PVOs. The Ministry of Health is responsible for all health programs directed at Sudanese nationals. Thus, HKI works through two separate government administrative structures to serve the populations in its project areas.

During the first year of the program, a major achievement was securing registration for project operations in Sudan. As will be described in the section on program constraints, the process of obtaining a license to operate as a PVO in Sudan took longer than foreseen. Without such registration, the country director was not authorized to conduct or implement the proposed activities.

Once the license was obtained, however, considerable work was accomplished. Following is a list of completed activities from year one.

1. Preparation of an outline of a work plan.
2. Preparation of training manual for primary health care workers.
3. Preparation of a flip chart for nutrition education to mothers and community groups.
4. Completion of survey design for assessment of vitamin A deficiency in N. Darfur province, N. Kordofan province, and Red Sea province.
5. Monitoring consultations to eastern region refugee camps.
6. Revision of vitamin A deficiency treatment and prevention guidelines in the refugee camps.
7. Provision of 200,000 vitamin A capsules (200,000 I.U.) to COR Health Unit for distribution to camps in the eastern refugee camps.
8. Conduct of training seminar for Nutrition officers in Khartoum.
9. Presentation on xerophthalmia, its detection, treatment, prevention and monitoring, to international and local health workers in Showak, at the nutrition coordinating meeting.
10. Conference at HKI/New York with technical and managerial staff from headquarters and other African countries to identify common issues, strategies, and recommendations.

The second year was characterized by consolidation of previously started activities, and initiation of numerous planned activities. The following includes the activities undertaken in year two:

1. Translation into Arabic and printing of training materials;
 - 1,000 copies each of a "Training Manual for Primary Health Workers" and a "Flip Chart for Nutrition Education to Mothers and Community Groups" were printed.
2. Conduct of a training course for Trainers in Darfur and Red Sea Province:
 - Three Ophthalmic Medical Assistants and three Nutrition Officers completed the Trainer Course conducted in October, 1987 in El Fasher, North Darfur.
 - In August of 1988, 16 district trainers were trained in Port Sudan, Red Sea Province to form eight teams of district trainers for the eight districts of the province.
 - The four-day course included three days classroom instruction and one day practical field work.
3. Training of Primary Health Workers in five districts of North Darfur:
 - The duration of each session was three days with the last day reserved for practical field work and demonstration.
 - A total of 207 health workers were trained in the province - 109 Community Health Workers, 73 Medical Assistants, 9 Nurses and 16 Health Visitors completed the course.
4. PVO health staff training in Khartoum:
 - 14 Primary Health Workers working with displaced peoples health program undertaken by Sudan Council of Churches were trained in February, 1988.
5. Training seminars for PVOs working in Refugee Health Care in Showak, eastern Sudan:
 - A one-day vitamin A seminar was sponsored and conducted by HKI, involving 50 participants representing 11 organizations.

6. Preparation of a complete "Manual of Vitamin A Program Guidelines for Refugee Affected Areas of Sudan":
 - Duplicate copies of the manual were distributed to all PVOs and government agencies working in refugee health work in Eastern Sudan, October, 1987. These guidelines replaced the old "Emergency Guidelines for the Treatment of Vitamin A Deficiency" cards.
7. Conduct of a vitamin A deficiency prevalence survey in North Darfur:
 - This was undertaken for February 6th and March 16, 1988 in five districts in North Darfur and the analysis showed that vitamin A deficiency in the province is not a significant public health problem at the present time. However, it suggested that VAD becomes a significant and serious problem during droughts and famine. Important changes in program strategy and focus brought about by the findings. A copy of the survey is attached to Annex I.
8. Monitoring and field consultations to eastern region refugee camps:
 - HKI Country Director made three visits to refugee camps and provided consultations to PVOs on clinical diagnosis of VAD, treatment and prevention guidelines, program operation and monitoring.
9. Emergency vitamin A supplementation guidelines and ocular screening procedures for new refugee (Ethiopian) in flux into eastern region reception camps:
 - HKI prepared "emergency guidelines for treatment and prevention of vitamin A deficiency" and ocular screening procedures to detect cases of VAD.
 - HKI advocated blanket vitamin A dosing to children under 15 years of age; ocular screening and therapy of children with VAD; measles immunization to children; and treatment doses to high-risk children (i.e., those with measles or severe malnutrition) to be done at time of first screening at reception centers for new arrivals.
10. Integration of vitamin A coverage survey with nutritional surveillance in the eastern region refugee camps:
 - The methodology was explained to PVO seminar participants during the January vitamin A seminar. The survey uses the same sample of children (under 5 years of age) used for nutritional status assessment

to estimate vitamin A coverage. The estimated coverage is represented by percentage of children with recorded vitamin A receipt in the period six months prior to the day of the survey.

- In refugee camps, recording of vitamin A administration is done on the Road to Health Cards (RTH).
- Coverage was estimated twice in 1988, in February and in June.

11. Provision of megadose vitamin A Capsules (200,000 I.U.):

- 440,000 vitamin A capsules were provided to the Ministry of Health for distribution to children in flood-affected areas of Khartoum and other regions.
- 116,000 capsules of vitamin A were delivered to COR for distribution to eastern refugee camps.

12. HKI technical and training assistance during nutritional emergencies due to disasters:

- In August, 1988 heavy rains and overflowing of the Nile caused serious flooding in the National capital and the northern region of Sudan. The flooding destroyed many houses and contaminated drinking water, rendering over a million people homeless. An emergency nutritional and medical assistance was organized to prevent communicable disease outbreak, starvation, and deaths. The Ministry of Health, Nutrition department prepared guidelines for "Emergency Nutritional Rescue Operation Plan of Action" with input from HKI on vitamin A distribution guidelines:
 - o Blanket distribution of one dose of vitamin A capsule to children under 5, and treatment of children with VAD, measles, severe malnutrition and chronic diarrhea. Implementation was through both mobile teams and static health units.
 - o HKI provided the first 40,000 capsules for the emergency distribution from in-country stock.
 - o Mobile teams distributed 21,000 capsules in the first week of operation. Data from static units are not available.

At present, PVOs under the guidelines of the Nutrition Department are conducting nutritional status surveys in the areas where MUAC screening performed by the mobile teams revealed serious levels of malnutrition. Vitamin A capsules are allocated by the Nutrition department to PVOs for distribution in their respective project areas.

13. Sponsorship of Counterparts to international conferences:

- In December 1987, the project sponsored the HKI Country Director and his government counterpart, the Director of the Nutrition Department, to attend the 10th international IVACG meeting in Addis Ababa. The Deputy director of the Nutrition department was sponsored by UNICEF, at the recommendation of HKI.

14. Consultations with HKI/New York:

- HKI Country Director held consultations and meetings with HKI/New York technical and managerial staff and HKI medical advisors to review project activities, survey data, and identify appropriate strategies as well as future directions for the program.

Following the completion of year two's activities, the project was granted two no-cost extensions, the first for six months and the second for one year. During the first extension period project activities focused on a vitamin A support program to the Directorate of Health, Red Sea province (See Annex V for plan of action for Red Sea Province and planning for the future of Vitamin A activities in this country.) Two main activities in Red Sea Province were:

1. A vitamin A deficiency prevalence survey to be used as baseline data for future intervention activities.
2. Training sessions for Primary Health Workers in the province.

The training was initiated as planned starting August, 1988. Although the implementation of the survey was scheduled for September, 1988, the Director of Health services for the province (Dr. Omer) kept delaying it and asked to postpone the training as well.

The prevalence survey was finally implemented in November and December 1989. Approximately 2,000 children ages 0-6 years were examined from ten randomly chosen sites (4 urban and 6 rural). Data will be available by the end of the grant.

HKI responded to a request for emergency vitamin A capsules for children in the war-torn south of Sudan. Approximately 125,000 capsules were distributed by IRC and others. During this same period, HKI took steps to turn over project ownership to local authorities.

Towards this end, the following activities were accomplished:

1. Project office closure in Darfur, with the Darfur Directorate of Health assuming responsibility for "Vitamin A Therapeutic Program" in association with PVOs in the region.
2. Phasing out program activities from the eastern region refugee camps. Responsibility for continued vitamin A supplementation will be assumed by COR-Health Unit in collaboration with PVOs and funding support from UNHCR.
3. Securing vitamin A program assistance to the Ministry of Health beyond the life of the grant. HKI assisted the Nutrition Division of the MOH in the development of a proposal to UNICEF for direct assistance, beyond the life of the HKI project, for ongoing vitamin A activities. In addition, HKI's new VITAP (Vitamin A Technical Assistance) program will provide technical assistance to PVOs with child survival programs in Sudan, pending authorization from USAID for AID funded projects to continue in the country.
4. The First National Vitamin A Workshop was held from December 4-6, 1989 in Khartoum. The purpose was to bring together representatives from all government ministries, as well as international agencies, working to reduce vitamin A deficiency in Sudan.

The objectives of the workshop were:

- a. To create an increased awareness about vitamin A deficiency and to present available data on the status of vitamin A deficiency in various parts of the country.
- b. To present information describing current surveillance, training, and capsule distribution activities going on at the national, regional and certain local levels.
- c. To describe the role of the Department of Nutrition of the Ministry of Health in standardizing guidelines, surveillance and reporting strategies, training strategies, materials development, and the supply of vitamin A capsules.

- d. To determine strategies for future activities with regard to training and service delivery, reporting and surveillance, and agriculture and gardening.
- e. To describe future plans for activities to address vitamin A deficiency in Sudan in the interest of fostering collaboration between agencies, organizations, and the Department of Nutrition.

The workshop was attended by over sixty individuals from a large number of organizations. Details of the workshop can be found in Annex 7.

E. Improvements of Program Quality

Throughout the life of the project, several measures were taken to improve the quality of programming, information gathering, and knowledge of project staff and MOH counterparts.

1. HKI Country Director and his counterparts, the Director of the Nutrition Department and the Deputy Director attended and participated in the 10th IVACG meeting held in Addis Ababa, Ethiopia in December, 1987.
2. HKI Country Director attended and participated in the Child Survival Workshop held for USAID-funded PVOs involved in child survival activities in Africa. The workshop was held in Kiboko, Kenya from June 18 - 24, 1988. This workshop provided information about other child survival programs and their linkages to the overall child health strategy in developing countries. Lessons learned and ideas picked up in the workshop were shared with project staff in Khartoum, improving program operations.
3. To improve vitamin A recording and information collecting systems in project areas (eastern refugee camps), existing elements were reinforced and new ones introduced through seminars and field visits by HKI staff.
 - a. In a PVO seminar held in Showak on vitamin A deficiency, sponsored and conducted by HKI staff, a major portion of time was allotted to a discussion on improved recording and information gathering techniques. The use of Road to Health cards for recording and follow-up of children was stressed, as well as the importance of collecting vitamin A coverage data during regular nutritional status surveys undertaken by PVOs.

- b. The seminar also served as a training forum for health personnel participants. Various aspects of vitamin A deficiency (risk factors, linkages with measles/malnutrition/ARI/diarrhea/feeding practices, clinical manifestations and diagnosis, treatment and prevention, monitoring and reporting) were extensively presented by HKI Country Director.

II. LINKAGES TO COMMUNITY, GOVERNMENT, AND NGO HEALTH ACTIVITIES

In the refugee camps, HKI -- working directly with COR - Health Unit and United Nations High Commission for Refugees -- provides vitamin A technical assistance to PVOs through treatment and preventive guidelines, training sessions and seminars to PVOs, training materials, consultation to PVOs, and supplies of vitamin A capsules. The program is implemented in refugee camps by PVO health personnel as part of an integrated refugee health care program, which includes:

1. therapeutic and preventive vitamin A distribution;
2. recording and reporting;
3. monitoring and data collection for vitamin A coverage estimates;
4. in-service training of health staff, and
5. health and nutrition education.

Annex II contains a list of collaborating PVO involved in vitamin A activities. In addition the project was integrated in the MOH system; mainly the Nutrition Department, and the local health staff of the three regions where it was implemented.

III. HUMAN RESOURCES AND TECHNICAL SUPPORT

The project employs one expatriate Country Director, one locally-hired Project Administrator, one Driver and one Secretary. (Annex III)

From the Nutrition Department, Ministry of Health/Khartoum, three Nutrition Officers seconded to the project staff continue to work with HKI. The Director, Nutrition Department works as a counterpart of HKI's Country Director.

In Darfur, the regional team consists of a Program Coordinator, three Medical Ophthalmic Assistants, all of which have been seconded from the Ministry of Health. The Director General of

Health, Darfur region, has primary responsibility for overseeing the project activities, assigning and supervising MOH personnel, and managing project funds allocated for the program.

A similar structure has been established in Red Sea Province with the Directorate of Health/Port Sudan.

HKI Country Director visited HKI Headquarters for a two-week consultation with HKI technical staff and Medical Advisors (April/May 1988) during which discussions were conducted on the North Darfur vitamin A survey results, and future directions of the Sudan vitamin A project.

Special experts in training, educational materials development, vitamin A related issues, monitoring, and evaluation are available at Headquarters to call upon when the need rises. This support was provided either through visits from Headquarters experts to field or vice versa. The project also received assistance from other divisions of Headquarters such as Accounting, Personnel, Procurement, computers, etc.

Victoria Sheffield, HKI Training Director, spent 25 days in Sudan to develop training material in July-August 1987. She was accompanied by HKI's Epidemiologist Dr. Nancy Sloan who developed the survey assessment methodology. In November 1989, Ms. Sheffield visited the project for 15 days to conduct the mid-term evaluation with external consultant Dr. David Pyle from John Snow, Incorporated. From June 2nd to 9th, 1989, Ms. Sheffield visited the project to follow on the recommendations of the evaluation.

IV. PROJECT HEALTH INFORMATION SYSTEMS

At the start of the project the information on actual prevalence of vitamin A deficiency in Darfur region was inadequate. The only data on vitamin A deficiency for Darfur region was from SERISS. This survey was conducted in four rounds in 6 regions in the North (from 1986 to 1987). Data are only available for night blindness for children under 5 years of age; ocular examinations were not included. Although the results are variable (round I to round IV), significantly high prevalence rates of night blindness were found in Darfur region, Kordofan, and some parts of Kessalla.

However, night blindness is an indicator of vitamin A deficiency, potentially prone to bias. For example, the SERISS data on rates of night blindness show very significant variations in each of the four rounds which cannot adequately be explained by seasonal variation.

Therefore, project staff decided to undertake an assessment of vitamin A deficiency to serve as a baseline for the program. Due to time and financial parameters, a rapid assessment survey was undertaken.

A. Baseline Survey

In February/March 1988, a vitamin A deficiency prevalence survey was conducted in North Darfur. A rapid assessment methodology developed by HKI consultants and epidemiologist was used. A proportional sample of rural and urban areas, stratified by districts with sampling units being village councils, farigs and urban quarters.

The survey protocol and field manual were developed in 1987 with assistance from HKI Headquarters epidemiologist. Survey forms were prepared with the idea that only information pertinent to the program could be collected. Pre-testing of the survey forms and survey procedures was done prior to the survey conduct in Darfur. The survey team members participated fully in this exercise. Some minor changes were made in operational schedules based on the exercise.

A total of 1,914 children under 6 years of age were included in the survey in five districts of North Darfur. The sixth district was not surveyed because security problems precluded the survey team from traveling to the sample sites. Therefore, in total eight rural samples and one urban sample were taken.

The data collected was analyzed in the computer center in the Ministry of Health, Khartoum using a statistical software, SPSS. Overall, the analysis showed that the prevalence of vitamin A deficiency in North Darfur was below the WHO prevalence criteria for a significant public health problem. However, the data suggested that there may be sporadic cases or even pockets of significant vitamin A deficiency in some areas in the province. But data collected were not adequate enough to determine if this was a chance variation or actually represented a true variation.

The findings of significant numbers of corneal scars attributed to VAD/measles with a history of first appearance coinciding with the period (1983/84) suggested a high prevalence of serious corneal lesions (xerophthalmic) during the same period. This indicated that the region is a high-risk area for vitamin A deficiency during such times as droughts or food deficits and population displacement that periodically occur in Darfur.

Following review of the survey data at the Ministry of Health, Khartoum, and consultations with HKI headquarters technical staff and Medical Advisors in New York, the following

recommendations were put forward and adopted, resulting important changes in the program.

1. Because of the survey showing that VAD is not a significant public health problem at the present time, periodic vitamin A capsule distribution is not required. However, since cases of vitamin A deficiency do arise in the communities, and since the region is a high-risk area for serious xerophthalmia in times of drought/food deficits, monitoring of the region is necessary (to mount a prophylaxis distribution as and when it is needed).
2. A treatment protocol was integrated into the PHC system, with vitamin A capsules included in the drug kits for PHC for treatment of cases of vitamin A deficiency that arise within the communities. Treatment is available at rural hospitals, health centers and PHC units.
3. In order to meet the present needs for identifying and treating children with VAD and future needs (in case of drought or food deficit due to man-made or natural causes), the training program was completed as planned in all the districts of North Darfur. (A detailed report of the Survey is in Annex I).

B. Monitoring System

The project essentially works through the existing health infrastructure of the Ministry of Health. A realistic monitoring system must take into consideration the capacity of the government health system in collecting and analyzing data required for monitoring purposes. In recognizing that the recording and reporting of important health information within this system is limited, the project instituted a simple monitoring mechanism focusing on minimal data requirements for tracking the vitamin A activities.

Such data essentially involved vitamin A distribution and cases of xerophthalmia treated. The following framework illustrates the system.

Monitor flow of vitamin A capsules (VAC):

- number of health facilities that received VAC supplies during the three-monthly distribution
- number of capsules used at each health facility per month
- number of capsules distributed during biannual mass dosing.

Monitor vitamin A deficiency in children (VAD):

- number of children treated at health facilities per month
- number of children referred per month.

Project monitoring is also done in the refugee camps in Eastern Sudan where periodic vitamin A capsule distribution has been in progress for over three years. The project primarily monitors the adequacy of preventive vitamin A coverage in children under five years of age. (Although the target population for vitamin A distribution is 0 - 6 years of age, the monitoring tool is limited to the children under five years of age because of its incorporation with existing nutritional status surveys done by PVOs at regular intervals.)

Recording of therapeutic and preventive vitamin A administration is recorded on the Road to Health Card (RTH) of all children up to age 5. Repeated assessments of RTH retention rates in the refugee camps has consistently averaged over 85%. Therefore, assuming all vitamin A administrations are recorded on the RTH cards, reliable assessments of coverage could easily be made of not only vitamin A, but all immunizations.

In 1988, vitamin A coverage assessments were done in February and June as part of the periodic nutritional status surveys conducted by PVOs in refugee camps. The methodology is as follows. Vitamin A coverage is estimated from the same children sampled for nutrition assessment based on a cluster sampling technique. At the time of the nutritional assessment, records of receipt of vitamin A capsule (preventive) for the period six months prior to the day of the survey is read off the RTH cards. Where no record is found, it is entered on the survey form as negative. The percentage of children who received a capsule from the survey is calculated to arrive at vitamin A coverage.

The data are analyzed by COR-Health Unit in Showak, and reports are distributed to the PVOs with recommendations for action.

In addition to vitamin A coverage data, the project draws on the regular nutritional morbidity and mortality data that are collected by PVOs and reported to COR. Indices of particular interest to the project have been malnutrition rates and trends, incidences of diarrheal, respiratory infections and measles, as well as immunization coverage with particular reference to measles.

Project recording and reporting system for vitamin A distribution designed for North Darfur were not implemented as a result of the survey showing insignificant VAD in the region. The "universal" vitamin A distribution were not put in place, rather a treatment protocol was set up.

The next page shows Tier I indicators as collected by the project.

INDICATOR (Tier I)	
Total Population	3,764,270
No. of children under 12 months	149,511
No. of children between 12 & 23 months	135,513
No. of children between 24 & 35 months	124,221
No. of children between 36 & 59 months	237,149
No. of children between 12 & 59 months	500,648
No. of women of reproductive age	741,561
No. of women between 15 & 19 years	214,563
No. of women between 20 & 24 years	195,742
No. of women between 25 & 29 years	165,628
No. of women between 30 & 34 years	146,807
No. of women between 35 & 39 years	82,814
No. of women between 40 & 44 years	82,286
No. of women between 45 & 49 years	29,922
Estimate annual no. of live births	168,312
Life of Project Budget (USAID)	\$474,657
Life of Project Budget (HKI)	\$244,174
Estimated % of USAID contribution allocable to nutrition activities	100%
No. of project trained Health Workers	263
No. of proj. trained village hth workers	169
No. of service units providing vitamin A	
No. of VAC distributed by the project	756,000
No. of PVOs contacted	13
No. of supervisory tours	

C. Final Evaluation

The review of program activities took place between mid-November and mid-December 1988. The core team, consisting of Victoria Sheffield of HKI (Training Director) and David Pyle (John Snow, Incorporated - Consultant) each spent two weeks in country. Ms. Sheffield visited Northern Darfur Province where she reviewed the training activities while Dr. Pyle did the same in the Red Sea Province. The core team met with the Nutrition Department (MOH) and COR/UNHCR officials and visited refugee camps together.

The methodology used in this evaluation consisted of several elements. Program documents were reviewed. This included the grant agreement, annual program reports, survey methodology and findings, trip reports as well as government and COR/UNHCR materials. In addition considerable time was devoted to interviewing the government officials who had participated in the vitamin A deficiency control program. Officials at HKI and the central, provincial, district, dispensary, and primary health care unit levels of the MOH were also interviewed.

Community members in Northern Darfur and Red Sea were chosen at random and their knowledge of program activities were investigated. Questionnaires have been developed by HKI/NY to determine the effectiveness of their training programs and they were utilized in Sudan as well as part of the evaluation. Separate questionnaires were used for government counterparts, nurses, community health workers, and community members.

Site visits to districts and refugee camps where HKI activities have taken place were a vitally important part of the evaluation. Ms. Sheffield visited two areas in Northern Darfur District while Dr. Pyle observed program activities in Sinkat District of the Red Sea Province. Discussions at the service delivery point primarily with community Health workers made it possible to ascertain the effectiveness of the HKI-supported activities as well as provided an opportunity to identify and explore what type of HKI support might be considered in the future.

Major Findings consists of:

A. Northern Darfur Province

The targets established during the first year included both vitamin A coverage and training activities. However, because the survey found little evidence of xerophthalmia, and the decision was made not to initiate a vitamin A supplementation program, the former was no longer valid.

The target of training was accomplished. According to HKI records and site visit verification, all the targeted health personnel at the service delivery level have been trained and have a highly satisfactory level of knowledge on vitamin A deficiency. Generally, the health staff members found the training and associate materials to be very good. The survey in the province was delayed to February, 1988, making the findings not available during the training. The results were later presented to the staff and the program modified accordingly.

B. Red Sea Province

The survey design, sample size determination and random sample selection was developed at the same time as the Northern Darfur survey. However, due to lack of cooperation of the Director of Health for the province, the survey was delayed. Progress was made in the training of the district trainers who carried one round of training of health workers. Seven sessions of training were held, one in each district. A total of 139 health workers were trained. Site visits to Sinkat District showed trained health workers knowledgeable about vitamin A deficiency. The survey eventually took place at the end of 1989. Results will be forthcoming.

C. Other Activities

HKI has played a general facilitating role which has increase the awareness and support for vitamin A programming in Sudan. HKI also provided technical and training assistance during the floods of August, 1988. In addition, HKI provided 440,000 megadose vitamin A capsules for emergency distribution. It serves as an advisor on vitamin A matters for any group interested in initiating vitamin A activities in Sudan

D. Refugee vitamin A activities

The target established was to achieve 90% coverage of the target population in refugee camps. While the situation differed from camp to camp, it was clear that some PVOs were not distributing VAC on a regular basis. Coverage figures ranged between over 90% to below 10%. Logistic problems were the main reasons for the low distribution performed by some PVOs. The second target of HKI was to have 100% of the camps maintain regular and adequate supply of VAC. This did not seem to be a problem. It was difficult to assess whether the training target (90% of refugee health workers will attend at least one training session on vitamin A) has been achieved. Finally, it became clear from the meeting of PVO health workers that was little standardization in their vitamin A activities.

Results of the evaluation were communicated to the project staff, participants, and all other professional implicated in the implementation of the activities. In addition, HKI requested and received a no cost extension with the aim to implement the recommendations. Annex IV includes a full description of the mid-term evaluation.

V. WORK PLAN AND CONSTRAINTS

Meetings were held with officials of the Ministry of Health and USAID/KRT in September 15, 1986, to lay the foundation for the project. The first order of business was the signing of an agreement with the Ministry of Health. By February 1986 an understanding was reached on the signing of a project agreement, however, the actual signing of the document was delayed until 24 February, 1987.

The reasons for the delay in signing the agreement and obtaining a licence to operate were based, in summary, on the following events.

- Late 1986 was a transition period from a military to a democratically-elected government. Therefore, earlier regulations and directives were suspended. One such causality was a so-called "Technical Committee" who reviewed PVO program proposals. This Committee was disbanded by the new government without making alternative arrangements to take care of its functions.
- After six months elapsed, the Committee was reconvened to review the backlog of PVO project applications. A license to operate in the Sudan for six months was granted to the applicants (7 February 1987) following which it was possible to sign an agreement with the Ministry of Health.

This bureaucratic impasse was a major obstacle to initiating work on the project. However, the major constraint in actual implementation was logistics. The primary area of focus for the program is in N. Darfur, located in the western part of the country. Transportation by road is impossible during the rainy season. During the dry season, it takes from 5 to 10 days by road. The only quick way of getting to El Fasher, the capital of Darfur, is by air. Sudan Air has unreliable air connections in-country. Though theoretically daily flights are available from Khartoum to El Fasher, one has to book months in advance, and yet may find that without warning the flight is cancelled. Further, up until the end of 1987, small charter planes of the UN agencies, other NGOs (i.e. Save the Children/UK, MSF) and

USAID were made available. Now the government is frowning upon such practices, presumably because of security precautions.

Within Darfur, road links between district capitals are meagre, where travel on tracks (no paved roads) with four-wheel drive is required.

A final critical constraint to project implementation is the uncertainty under which PVOs in general operate in the country. This is a direct consequence of the lack of a clear policy on the part of the government with regard to the legal status of PVOs. This is manifested in several ways: travel permit requirements, changing ad hoc regulations for import license and customs exemption criteria; and lack of coordination between government ministries leading to increased time spent in shuttling between government offices.

A number of constraints were encountered during the second year which contributed to a delay in project implementation. A list of constraints and actions taken or proposed to remove them is discussed below.

1. Failure of the Darfur MOH to deliver two vehicles (formerly of SERISS Project, AID-funded) to Khartoum. HKI agreed to repair and rehabilitate the two vehicles on behalf of the MOH in support of the vitamin A activities in Darfur. Despite repeated requests for the cars, the Darfur health authorities failed to comply, HKI was forced to withdraw its offer in February, 1988, resulting in a four-month delay in starting survey activities.

Action Taken: HKI/Khartoum Project vehicle (Toyota hilux 4WD) was transported to Darfur in February, 1988 to be used in the survey and training activities. A vehicle was rented to be used in the Khartoum HKI office.

2. Poor road and communication infrastructure within Darfur and unreliable air links and postal links between Khartoum and El Fasher. This caused delays in receiving field reports at HKI Khartoum, scheduling and rescheduling of planned activities, and delays in taking remedial actions. This was compounded by problems of security in the region, constant shortage of fuel and vehicle maintenance facilities.

Action Taken: The maximum allowable barrels of fuel were purchased from the Darfur government whenever a fresh lot of fuel arrives in the region. (Two to three

barrels of fuel.) Whenever possible, project staff were flown in planes chartered by MSF Holland, and military planes with their kind permission.

3. Poor motivation of health personnel to work in difficult field conditions.

Action Taken: Financial incentives were paid to instructors, trainees and coordinators strictly based on days spent outside one's duty station on project activities. Certificates were given to all health personnel who completed the vitamin A training course.

B. Future Activities

The plan for the remainder of the project life is to analyze the data from the Red Sea province prevalence survey and to continue to phase down project activities. Given the status of the USAID mission at the present time, HKI is not planning for activities beyond February 1990, the end of the current grant, except perhaps as requested by the Department of Nutrition through UNICEF.

The project was successful in identifying the importance of vitamin A, needs assessment, policy making, public awareness, VAC supply, and emergency intervention. Institutionalization within the MOH and PVO community has taken place.

Continued periodic technical assistance from HKI is recommended for training, monitoring and evaluation. The government will submit a proposal to AID (bilateral support) and UNICEF to support continued vitamin A intervention, including consultancies from HKI as required. Further, through another AID-funded mechanism (FUA/PVC's UN AP grant) HKI can provide technical assistance once relations between US and government normalize.

VI. PROJECT EXPENDITURES AND BUDGET REVISIONS

(Includes expenses through September 1989. Expenses for the National vitamin A workshop and the prevalence survey in Red Sea Province - both of which occurred after October 1989 - are estimated.)

HELEN KELLER INTERNATIONAL, INC.
 1989 ANNUAL REPORT FORM A: COUNTRY PROJECT PIPELINE ANALYSIS
 PVO / COUNTRY PROJECT- DAN-0045-G-SS-6011-00

SUDAN COST ELEMENTS	ACTUAL EXPENSES TO DATE (9/1/86 to 9/30/89)			PROJECTED EXPENSES AGAINST REMAINING OBLIGATED FUNDS (10/1/89 to 2/28/90)			TOTAL AGREEMENT BUDGET (9/1/86 to 2/28/90)		
	AID	HKI	TOTAL	AID	HKI	TOTAL	AID	HKI	TOTAL
PERSONNAL	\$142,592	\$70,485	\$213,077	\$1,513	(\$57,311)	(\$55,798)	\$144,105	\$13,174	\$157,279
ALLOWANCE	\$56,083	\$2,668	\$126,568	\$53,297	(\$2,668)	\$50,629	\$109,380	\$0	\$109,380
CONSULTANTS	\$300	\$16,809	\$2,968	\$4,700	(\$16,809)	(\$12,109)	\$5,000	\$0	\$5,000
SUPPLIES	\$7,456	\$1,188	\$24,265	\$40,744	\$208,812	\$249,556	\$48,200	\$210,000	\$258,200
MEDICAL EQUIPMENT	\$26,131	\$18,954	\$45,085	(\$23,131)	(\$14,954)	(\$38,085)	\$3,000	\$4,000	\$7,000
TRAVEL	\$110,832	\$15,281	\$126,113	(\$11,382)	\$1,719	(\$9,663)	\$99,450	\$17,000	\$116,450
OTHER DIRECT COST	\$27,325	\$33,782	\$61,107	(\$13,325)	(\$33,782)	(\$47,107)	\$14,000	\$0	\$14,000
TOTAL DIRECT COST	\$370,719	\$159,167	\$529,886	\$52,416	\$85,007	\$137,423	\$423,135	\$244,174	\$667,309
INDIRECT COST	\$32,568	\$28,332	\$60,900	\$2,129	(\$28,332)	(\$26,203)	\$34,697	\$0	\$34,697
TOTAL COST	\$403,287	\$187,499	\$590,786	\$54,545	\$56,675	\$111,220	\$457,832	\$244,174	\$702,006

12/06/89

218

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ANNEXES

1. Vitamin A prevalence Survey, North Darfur
2. Population and PVO responsible for refugee camps in Eastern Sudan
3. Job description and role of project staff
4. Final Evaluation
5. Vitamin A support program (Red Sea Province)
6. List of educational materiels developed by the project

11

ANNEX I

VITAMIN A PREVALENCE SURVEY

NORTH DARFUR

VITAMIN 'A' DEFICIENCY AND XEROPHTHALMIA
PREVALENCE ASSESSMENT SURVEY IN
NORTHERN DARFUR

February -March, 1988

Nutrition Department
Ministry of Health
Khartoum

Helen Keller International
Khartoum.

SUMMARY

An assessment survey of Vitamin A Deficiency (Xerophthalmia) was carried out in Feb-March, 1988 in 5 districts of Northern Darfur to determine prevalence of VAD in children under 6 years of age. Information on nightblindness and ocular signs of VAD as well as information on other associated conditions (diarrhea, fever, cough and measles) was collected from a total of 1919 children. The sample sites included 9 rural and 1 urban site (9 village councils, 1 urban quarter).

The overall prevalence of Vitamin A Deficiency was found to be 0.73%. This included individual rates of 0.52% for nightblindness, 0.1% for Bitot's spots and 0.1% for corneal opacities (scars.). All the 10 cases of nightblindness and the one case of Bitot's spots were found in the rural sample.

When prevalence rates for each sample site were looked at, significant levels of nightblindness prevalence rate were observed for village councils Sanger, Dulal, Kurge in Kuttom district (1.7%) and Shag Zaroog in Um Kedada district (1.0%). However, there was no statistically significant difference in nightblindness prevalence between sample sites. Bitot's spots were absent in all sample sites save one in Tosal village council of Mellit district. Out of a total of 7 corneal scars identified, only 2 were associated with VAD and measles. The corneal scar rate attributable to VAD/measles was 0.1%.

Conclusion: The data suggests that in North Darfur, the prevalence of active Vitamin A Deficiency in children is not a significant public health problem when compared with the minimum prevalence criteria set by WHO. However, the data suggests that Vitamin A Deficiency may be a problem in certain pockets (geographical or village clusters sharing similar conditions) and not a widely spread problem in North Darfur. The pockets of higher than normal nightblindness rates (Sanger, Kurge, Dular village councils in Kuttom district and Shag zaroog village council of Um Kedada district) may signify a simple chance variation or a true variance suggesting that there may be common risk factor/factors shared by these villages that exposes them to vitamin A deficiency.

Given the fact that two of the corneal scars associated with VAD/measles occurred during the drought years of 83/84, this suggests that communities in North Darfur were at particularly high risk for developing serious corneal scars.

Many more children may have gone blind and probably died soon after during the drought years.

In the final analysis, the most probable scenario in North Darfur is that Vitamin A Deficiency occurs at insignificantly low level of endemicity throughout the year with possible pockets of mild xerophthalmia in certain areas. This is supported by the following;

1. that nightblindness was found in almost all the sample villages although the prevalence level was insignificant for the whole province.
2. that the condition of 'nightblindness' is known to the communities and that there infact exist specific local terms for it; Amele'li, ginfet, jhaar, jahman, toormu, wa'ala ootri etc. The presence of such a plethora of local terms is very suggestive of vitamin A deficiency. However, interviews of mothers revealed that nightblindness was a widespread problem during the drought not only among children but also among adults (especially pregnant women) as opposed to now where it is not a common condition.

However, North Darfur is an area that suffers from recurrent, periodic drought that poses serious nutritional problems of PEM and specific nutrient deficiencies, foremost among them being vitamin A deficiency. During the last drought, the marginal vitamin A status was compromised by chronic food shortages resulting in widespread vitamin A deficiency among children. This is suggested by the corneal scar data and the positive history of widespread occurrence of night blindness associated with the drought obtained from interview of mothers.

Recommendations:

1. The ongoing training program for CHWs, Medical assistants, Nurses and Health Visitors should continue until all targetted districts are covered. Emphasis should be put on recognition, treatment and prevention of VAD along with skills to enable health workers to serve as the frontline workers within their areas of posting to respond to emergencies requiring preventive vitamin A capsule distribution. The training program should have

two goals in mind:

- a. to equip health workers with the necessary knowledge and skills to identify active cases of VAD and provide treatment.
 - b. to equip health workers with the knowledge and skills to effectively mount a preventive and therapeutic program during nutritional emergencies such as when it occurs during famine, drought/ or and large scale displacement of populations.
2. Treatment should be made available at all health facilities including primary health units to all cases of vitamin A deficiency that arise within the community. The implementation of this treatment protocol as an ongoing component of primary health care activity should be supported by adequate supplies of Vitamin A capsules in all drug kits sent to health facilities.
 3. Vitamin A deficiency should be monitored in this high risk region in order to facilitate timely and coordinated implementation of an appropriate intervention to control and prevent nutritional blindness among children. This is especially important during times of impending famine caused by rain failure or other man made disasters.

1.0 METHODOLOGY

1.2 A simple random sample stratified by urban and rural status, additionally stratified by district was chosen. Given that the percent urban population in North Darfur is 12.2%, to obtain a proportionally representative sample of rural and urban areas and assuming that all children under 6 years of age in each sampling unit are included in the sample, it was determined that 9 rural samples and 1 urban sample would be required. The sampling units are Village Councils/Farigs and Urban Quarters.

1.3 Sample size calculation:

Assuming an alpha (type one) error of 0.05 and d= accuracy (in this case meaning lowest detectable rate constituting a public health problem) = 0.005, p= prevalence , q=1-p and prevalence of X1B= 0.3XN in the high risk season, then

$$n = Z^2(pq) / d^2 = 1.96^2(0.01 \times 0.99) / 0.005^2 = 1521$$

Increasing the sample size by 30% to account for the design effect (sampling by village rather than by individual child), the sample size required would be 1,978.

1.4 Survey team: A survey team of 5 people were assembled. This consisted of an enumeratör, interviewer, clinician/examiner, driver, and coordinator. One wee before the survey, the team members were given a two day oreintation about the survey field proceduresand the organisation of the survey. On the third day, the team conducted a mock surveyin a village 25 miles north of El Fasher town^{to} provide the team members with practical experience and also test the survey instruments. Problems were identified and necessary corrections instituted.

1:5 Data Collection/field procedures: Once the survey team members arrive at a sample village council, they met with local officials (shieks or Oomda) and explained the purpose of thier visit and requested permission. Once permission is granted, the team members would draw a rough map of the area and mark the location of all the individual villages within the Village Council. This is done with the help of the village elders. Team movements are planned. The team would then travel to each village one by one to conduct the survey. In each village, a central place is chosen and all children under the age of 6 years are assembled with thier mothers or nearest relative. All eligible children are registered by the enumerator, and individually passed on to the interviewer (for mothers interview) and finally clinically examined for ...

Children with either vitamin A deficiency or conjunctivitis are offered treatment with with vitamin A capsules and Tetracycline eye ointment (1%) respectively. All other children with more serious ocular lesions are referred to El Fasher Hospital for treatment.

1:6 Data Analysis:

Information was collected on a two page pre-coded survey form. All the data forms were brought to Khartoum and data was entered into IBM computers at the Ministry of Health, dept. of Statistics. After data entry , an SPSS check was run to check accuracy of data entry. The data was analysed using the statistical package of SPSS.

2:0 RESULTS

2:1 Night blindness:

Information on nightblindness was collected from a total of 1901 children based on history given by the informant. 84.2% of the informants were 'mothers' and 15.8% were 'others' (father, sister, uncle etc.) Because of the high level of 'mothers' who were the primary source of information during the interviews, a high degree of reliability was obtained. A total number of 10 children had a positive history of nightblindness giving an overall prevalence rate of 0.5%. Rates for individual sample sites were higher in Sanger, Kurge, Dulal (Kuttom District) where 5 out of the total 10 cases occurred (1.7%). In Shag zaroog V.C., 2 children out of 205 had a positive history of nightblindness (1.0%).

The overall prevalence rate of 0.5% was not found to be significant when compared to the WHO minimum criteria of 1.0% for a significant public health problem of vitamin A deficiency. Although, rates exceeding 1.0% were observed in Sanger, Kurge and Dulal Village councils of Kuttom district, there is no other evidence to support labeling them problem areas as it may be a simple chance variation. If they represent actual true pockets of vitamin A deficiency, factors that puts them at this high risk may have to be investigated to arrive at a reasonable conclusion.

There were no significant differences between sample sites in the prevalence of nightblindness. All the 10 cases of nightblindness were found in the rural sample.

2:2 Ocular Signs of VAD:

Clinical ocular examination was done on 1911 children out of 1919 children included in the sample. In 8 children, clinical examination could not be completed due to refusal.

2:3 Bitot's Spots:

Out of the total number of children examined, 1 case of Bitot's spots was found in Tosal V.C. (Malha RC, Mellit District). This represents an overall prevalence rate of 0.1% which is not a significant level according to WHO minimum prevalence criteria for Bitot's spots of 0.5%.

10

The child (4 year old, female) with Bitot's spot was found in a small 'farig' (nomadic group) in Tosa! Village council. They owned a few goats but whatever milk they produced was reserved for the baby goats. They had lost most of the live stock during the last drought. At the time of the survey, the group of families were found near a 'wadi' (dry river bed) which is their temporary home. Poor rains in 1987 resulted in very little harvest of millet in the area. Their daily diet consists of millet porridge (asida) and a stew of dried tomatoes and lady fingers (bamia).

2:4 Corneal Xerosis/Ulceration/Keratomalacia:

During the survey, no active corneal lesion attributable to vitamin A deficiency was found. However, one case of unilateral corneal ulcer in a 6 year old boy was found in Sanger etc. (Kutum). The affected eye ^{was} red, with mucoid to purulent discharge. The ulcer was central and had jagged edges and a white halo around it. The other eye had mild redness (lids), and a clear cornea with no clinical lesions of vitamin A deficiency. There was no recent history of measles, lower respiratory infection or diarrhea. The corneal ulcer was probably not due to VAD but a result of earlier trauma with super imposed infection.

2:5 Corneal Scars/Opacity:

Out of 1911 children examined, 7 corneal opacities (1.0%) were found which were all unilateral. Only two had a positive association with VAD and measles which gives a prevalence rate of 0.1% in the sample population. The two cases of corneal opacity attributed to VAD/measles were found in the urban sample (Imtidad, El Fasher town.). The residents in this area are composed of displaced people who left their villages during the drought of 83/84. From the history of time of occurrence of the cornea scars, it appears that they coincided with the drought period in the region. The fact that the corneal scars occurred during this period leads us to conclude that drought or food deficits are times of high risk for serious vitamin A deficiency ⁱⁿ the region.

2:6 Blindness:

1908 children were screened for vision by testing perception of hand movements at one meter. 3 cases of unilateral and 2 cases of bilateral blindness were found. 3 cases were traumatic, 1 case was congenital and etiology could not be established for one case. Monocular blindness rate of 15.7/10,000 and binocular blindness rates of 10.5/10,000 children was calculated for the region.

3:0 DIARRHEA, FEVER, COUGH AND MEASLES

History of diarrhea, fever, cough and measles rash was collected for the period 15 days prior to the day of interview (including the day of interview). The information was obtained from mothers (84.2%) by the interviewer according to established procedures set before the survey.

3:1 Diarrhea:

The overall percent prevalence of a positive history of diarrhea was 13.1% (range 1% to 60.2%). There were significant differences between sample sites as well as between rural (10.2%) and urban (60.2%) areas. The worst area was the urban sample site in Imtidad (El Fasher town.).

3:2 Fever:

The overall percent prevalence of fever was 61.2% (range: 42.7 to 92.2%). Significant differences were observed between sample sites as well as between urban (84.1%) and rural (60.1%) and farig (57.1%). The highest levels were seen in Shag Zaroog (El leit RC of Um Kedada district) and Imtidad (el fasher town) with 92.7% and 84.5% respectively.

3:3 Cough:

An overall 43.5% of the children had a positive history of cough which is indicative of lower respiratory infection. The range was 35.5% to 76.1%. The urban (61.2%), rural (42.6%) and farig (33.3%) differences were significant. By far the biggest contributors to the high levels of prevalence of cough are Shag Zaroog (76.1%) and Imtidad (61.2%) which is consistent with the fact that these two sites also have the highest prevalence of fever. Fever and cough do occur together and this association is not surprising.

There were significant differences between the sample sites.

3:4 Measles:

Positive history of measles was observed in two sites. A prevalence of 0.5% and 1.9% were found in Sanger, Dulal (Kuttom D.) and Imtidad respectively. The overall percent prevalence in the sample population is 0.2%. Significant differences were observed between urban (1.9%) and rural (0.1%) samples.

TABLE I: List of Sample sites by Location

Sample Site Village/Urban Quarter	Rural/Urban Council	District
Heilat Salih V.C		El Fasher D.
Kheir Waged	Kettal R.C.	El Fasher D.
Tosal	Malha R.C.	Mellit D.
Sanger, Dulal & Kurge V.Cs.	Kuttom R.C.	Kuttom D.
Shag Zaroog	Um Kedada R.C.	Um Kedada D.
Oordi V.C		Geniena D
Humaida V.C.	Silaa R.C	Geniena D.
Rumalia V.C.		Geniena D.
Imtidad U.Q.	El Fasher T.	El Fasher D.

V.C= Village Council R.C= Rural Council
U.Q= Urban Quarter U.C= Urban Council
D= District

TABLE II:

Age Distribution by site

Age in months

Site	<12 months	12-24	25-36	37-48	>49
Heilat Salih	79	80	87	66	59
Kheir Wagid	54	59	65	43	38
Tosal	13	13	13	8	5
Sanger etc.	50	49	61	51	31
Shag Zaroog	48	39	37	28	24
Oordi	33	10	20	18	11
Humaida	24	11	16	16	5
Rumalia	64	54	66	42	46
Imtidad	18	20	16	25	10
Total	383	335	381	297	229
	20%	17.5%	19.9%	15.5%	12.0%

TABLE III:

Sex Distribution of Sample by Site

	Male		Female		Total
	No	%	No	%	
Heilat Salih V.C	219	50.1	218	49.9	437
Kheir Wagid V.C	149	50.5	146	49.6	295
Tosal V.C	41	58.6	29	41.4	70
Sanger, Kurge, Dulal V.C	144	50.0	144	50.0	288
Shag Zarcog V.C	112	54.6	93	45.4	205
Oordi V.C	63	50.0	63	50.0	126
Humaida V.C	53	60.2	35	39.8	88
Rumalia V.C	155	51.3	147	48.7	308
Tmtidad U.Q.	53	51.5	50	48.5	103
Total	989	51.7	925	48.3	1914

P = 0.6810 n.s.

TABLE IV:

Distribution of Informant by site

Sample site	Mother	Percent	Others	Percent others
Heilat Salih	372	85.3%	64	14.7%
Kheir Wagid	246	83.4%	49	16.6%
Tosal	53	75.7%	17	24.3%
Sanger, Dulal, Kurge	250	86.8%	38	12.5%
Shag Zaroog	177	86.3%	28	13.7%
Oordi	100	79.4%	26	20.6%
Humaida	72	81.8%	16	18.2%
Rumalai	251	83.1	51	16.9%
Imtidad	89	86.4%	14	13.6%
TOTAL	1610	84.2%	303	15.8%

(P = 0.2840, N.S)

TABLE V: Prevalence of Nightblindness by Location

Sample site	Sample size	+NB	Prevalence (%)
Heilat Salih	434	1	0.2%
Kheir Wagid	295	1	0.3%
Tosal	70	0	0.0%
Sanger, Dulal, Kurge	288	5	1.7%
Shag Zaroog	205	2	1.0%
Oordi	126	0	0.0%
Humaida	88	0	0.0%
Rumalia	302	1	0.3%
Imtidad	103	0	0.0%
Total	1901	10	0.5%

NB= nightblindness

TABLE VI: Prevalence of Nightblindness by Urban/Rural/Farig

TABLE VI: Frequency of Nightblindness by Urban/Rural/Farig status

Status	Sample Size	Frequency of NB	%NB
Rural	1787	10	0.6%
Urban	103	0	0.0%
Farig	21	0	0.0%

P=ns

TABLE VII:

Frequency of Eye Signs by Rural/Urban/Farig Status

	Sample Eye	Bitot's Spots	Corneal Xerosis/Ulcer/Keratomalacea	Corneal Scar
Rural	1787	0	1	6
Urban	103	0	0	1 (1%)
Farig	21	1 (4.8%)	0	0
Total	1911	1	1	7
% Attributed to VAD		0.1	0	2
VAD of Total		0.1%	0%	0.1%

Prevalence Criteria for Significant Public Health Problem of VAD	:	Night Blindness	1%
	:	Bitot's Spots	0.5%
	:	Corneal Xerosis/Ulcer/Keratomalacea	0.05%
	:	Corneal Scars	0.05%

TABLE VIII:

Total Frequency of Clinical Signs

/14

Total Examined	Bitot's Spots	Corneal Xerosis Ulcer/Keratomalacea	Corneal Scars
1908	1	1	7
No. Attributed to VAD	1	0	2
VAD	0.1%	0%	0.1%

NO Prevalence Criteria for significant Public Health Problem:

:	Night Blindness	1%
:	Bitot's Spots	0.5%
:	Corneal Xerosis/Ulcer/Keratomalacea	0.01%
:	Corneal Scars	0.05%

TABLE IX: Prevalence of Diarrhoea, Fever, Cough, Measles by Site

Sample Site	Diarrhoea	Fever	Cough	Measles
Heilat Salih	10.5	53.7	35.7	0
Kheir Wagid	6.1	42.7	36.6	0
Tosal	1.0	64.3	42.9	0
Sanger	2.9	57.6	44.8	0.5%
Shag Zarog	14.1	92.7	76.1	0
Oordi	12.7	46.0	37.3	0
Humaida	22.7	59.1	37.5	0
Rumiailia	18.2	71.5	36.4	0
Imtidad	60.2	84.5%	61.2	1.9%
Total	13.1%	61.4%	43.5%	0.2%
	P < 001	P < 001	P < 001	-

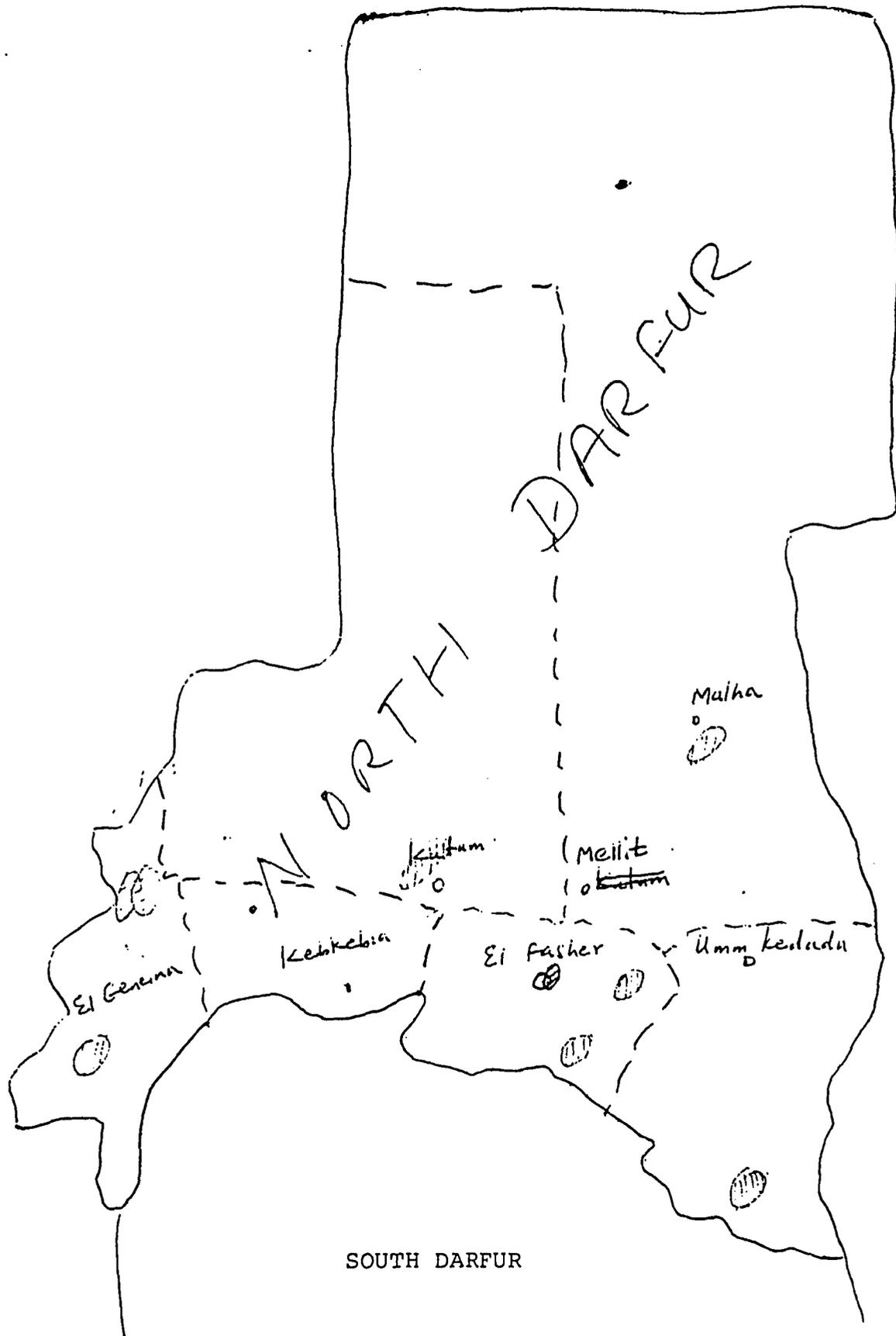
TABLE X: Prevalence of Diarrhea, Fever, Cough, Measles by
Rural/Urban/ Farig, N. Darfur

	Diarrhoea	Fever	Cough	Measles
Rural	10.2%	60.1%	42.6%	0.1%
Urban	60.2%	84.1%	61.2%	1.9%
Farig	0	57.1%	33.3%	0
	P < 001	P < 001	P < 001	P < 001

TABLE XI: Frequency of Blindness by Cause

Number	Unilateral/Bilateral	Cause
3	Unilateral	Traumatic
1	Bilateral	Congenital Cataract
1	Bilateral	Unknown, at birth

NORTH DARFUR SURVEY SITES



Survey Form

Child's Interview Form

Name of Region: _____

Name of District: _____

Name of Village Council, Urban Quarter or Parish

(check one) _____ VC=0 _____ UQ=1 _____ F=2

What is your / the child's mother name (triple name)?

What is the name of this child (triple name)?

Child's Code: _____

--	--	--	--

How old this child _____ Years _____ Months

--	--	--	--

Is this child a boy or a girl?

(check one) _____ M=0 _____ F=1

How are you related to this child?

(check one) _____ : Mother =0 _____ Other=1

In the past two weeks, has this child had severe Diarrhoea,
that is more than 3 loose watery stools for at least 24 hours?

(check one) _____ N=0 _____ Y=1

In the past two weeks, has this child had fever?

(check one) _____ N=0 _____ Y=1

In the past two weeks, has this child had measles rash?

(check one) _____ N=0 _____ Y=1

In the past two weeks, has this child had cough?

(check one) _____ N=0 _____ Y=1

Does this child have Nightblindness?

(check one) _____ N=0 _____ Y=1

Has this child received a Vitamin A Capsule in the past 6 months?

(check one) _____ N=0 _____ Y=1 _____ DK=8

OCULAR EXAM FORM

Absent=0 Present=1 Uncertain=8

right Left

- | | | | | |
|-------------------------|-------|-------|--------------------------|--------------------------|
| 16. Bitot's Spots | _____ | _____ | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. Corneal Xerosis | _____ | _____ | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. Ulcer/Keratomalacia | _____ | _____ | <input type="checkbox"/> | <input type="checkbox"/> |
| 19. Corneal Scars | _____ | _____ | <input type="checkbox"/> | <input type="checkbox"/> |

IF YES GO TO 20

IF NO GO TO 22

20. From the child's history, what was the age at occurrence of the corneal scar(s)? _____ Years _____ Months

21. Based on the clinical history and the lesions seen:

- a. Right Eye: Is scar related to VAD or measles?
_____ N=0 _____ Y=1
- b. Left Eye: Is scar related to VAD or measles?
_____ N=0 _____ Y=1

22. Hand Movements:

- _____ Yes=0
- _____ No; blind from trauma/injury=1
- _____ No; blind from infection (sick eye)=2
- _____ No; blind from measles=3
- _____ No; inferonasal blind=4
- _____ No; other=7

ANNEX II

POPULATION AND PVO RESPONSIBLE FOR
REFUGEE CAMPS IN EASTERN SUDAN

POPULATION AND PVOs RESPONSIBLE FOR REFUGEE CAMPS IN EASTERN SUDAN

ATTACHMENT XIV

Population and PVOs Responsible for
Refugee Camps in Eastern Sudan

<u>Camps</u>	<u>Population</u>	<u>PVO Responsible</u>
<u>I. Reception Centers</u>		
Safawa I & II	18,403	American Refugee Committee (ARC)
Shagarab I	20,001	Christian Outreach
Shagarab II	12,129	Christian Outreach
Shagarab III	13,365	Christian Outreach
Wad Sherefe	10,024	Swiss Red Cross
<u>II. Settlement Camps</u>		
Abuda	4,799	Llamba
Abu Rakham	3,640	International Rescue Com. (IRC)
Adingrar	5,440	Sudan Council of Churches (SCC)
Dehema	5,950	SCC
Fau V	4,161	ARC
Hawata	3,517	YMCA/IRC
Karkora	11,904	Save the Children-U.S. (SCF) & SCC
Kashmel el Girba	11,798	InterAid
Kilo 5	2,577	COR
Kilo 7	1,664	SCC
Kilo 26	12,069	League of Red Cross
Mefaza	3,211	IRC
Salmin	6,990	SCC
Suki Alsid	2,512	SCC
Tawawa	13,063	Rada Barnen/IRC
Tenedba	2,713	SCC
Um Ali	3,000	Lalmba
Um Brush	5,560	SCC
Um Gargur	8,244	SCC
Um Gulja	5,282	SCF (U.S.)
Um Rakuba I	8,629	SCC
Um Rakuba II	2,709	Rada Barnen
Um Sagata	7,516	SCC
Wad Awad	1,331	IRC
Wad el Heleau	12,010	Lalmba

ANNEX III

JOB DESCRIPTION AND ROLE OF PROJECT STAFF

I. Country Director and Project Manager

Responsibilities:

1. Set policies and standards for the implementation of the activities
2. Review every periodically the plan of action
3. Develop a detailed time table every six months
4. Set Monthly objectives
5. Follow project activities and assure completion of different tasks as scheduled
6. Bring technical expertise as needed
7. Plan, conduct, and attend training sessions
8. Acquire authorizations, and other documentation. Coordinate project relation with the MOH, USAID, and HKI
9. Collect Information and data for the monitoring
10. Overall management of the project including field activities, production, distribution, and monitoring of diffusion

II. Field Administrator

1. Assist the project Manager in all his tasks.
2. Conduct field trips to coordinate activities with peripheral participants
3. Coordinate logistics of the detailed implementation plan
4. Participate in setting monthly objectives
5. Participate in program development and evaluation
6. Participate in the planning and the implementation of project activities

ANNEX IV

FINAL EVALUATION

Annex IV

Final Evaluation:

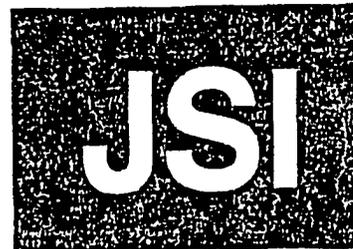
HKI Program of Nutritional Blindness Prevention/Control
for Drought Victims
(Program of Vitamin A Deficiency Control)
in Sudan
(Specific Support Grant No. DAN-0045-G-55-6011-00)

by

David F. Pyle, PhD.
Senior Associate
John Snow, Inc.

Victoria M. Sheffield
Director of Training
Helen Keller International

December 1988



JOHN SNOW, INC.

51

Final Evaluation:

HKI Program of Nutritional Blindness Prevention/Control
for Drought Victims
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in Sudan
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TABLE OF CONTENTS:

Maps	
Acknowledgement	
Glossary	
Executive Summary	
I. Introduction	1
II. Background	3
A. Grant Agreement	4
B. Program Start-Up	4
C. Finances	5
III. Ministry of Health Vitamin A Activities	6
A. Northern Darfur Province	6
1. Survey	6
2. Training Materials	8
3. Training of Health Workers	8
4. Findings	10
B. Red Sea Province	10
1. History	10
2. HKI 6-month Action Plan	11
3. Findings	11
C. Other Activities	15
D. Recommendations	16
IV. Refugee Vitamin A Activities	18
A. Situation	18
B. HKI-Supported Activities	19
C. Findings	20
D. Recommendations	22
V. Conclusions/Recommendations	24

Bibliography

Attachments

- I. TERMS OF REFERENCE
- II. LIST OF PERSONS CONTACTED
- III. PROJECT DESCRIPTION (FROM GRANT AGREEMENT)
- IV. PROJECT GOALS, OBJECTIVES AND TARGETS (FROM FIRST ANNUAL REPORT)
- V. APPROVAL OF NO-COST EXTENSION
- VI. CHILD'S INTERVIEW AND OCULAR EXAM FORMS
- VII. PREVENTION OF BLINDING MALNUTRITION: A TRAINING MANUAL FOR HEALTH WORKERS (TRANSLATION)
- VIII. SELECTION OF FLIPCHART PICTURES

- IX. GUIDELINES FOR PREVENTION OF BLINDNESS DUE TO VITAMIN A DEFICIENCY (XEROPHTHALMIA)
- X. AHMED "SHELEIL" AND HIS SISTER "OUM EIOUN" (TRANSLATION WITH ILLUSTRATIONS)
- XI. PRE/POST-TEST FOR HEALTH WORKERS RECEIVING VITAMIN A DEFICIENCY CONTROL TRAINING
- XII. OUTLINE OF TRAINING COURSE
- XIII. VITAMIN A EXTRACT FROM "NUTRITION PROGRAM GUIDELINES" (FOR EMERGENCIES)
- XIV. POPULATION AND PVOs RESPONSIBLE FOR REFUGEE CAMPS IN EASTERN SUDAN
- XV. "GUIDELINES FOR THE PREVENTION OF VITAMIN A DEFICIENCY AND XEROPHTHALMIA - REFUGEE CENTERS AND SETTLEMENTS"
- XVI. "EMERGENCY GUIDELINES FOR THE TREATMENT AND PREVENTION OF XEROPHTHALMIA (VITAMIN A DEFICIENCY)"
- XVII. LQAS MONOGRAPH



Acknowledgment

We would like to thank all those who facilitated this evaluation. The list is long as this was really a team effort. The cooperation from all parties involved made it not only possible to complete the task in the limited time allocated, but made it an educational and pleasant assignment.

Special thanks are given to Dr. Kamal, Director of the Nutrition Department, MOH, who gave generously of his time and thoughts during the course of the review. The same must also be said of his able assistants and staff, including Ms. Alawia, Ms. Ihsan and Ms. Durria. In the field Mr. Hasan, the Nutrition Officer for the Red Sea Province and Dr. Rashid, Director General for Health for Darfur, were most helpful in the discussion and tour of the vitamin A program in their respective areas. We are indebted to Dr. Zuhier el Nur, Director of International Health Office, MOH for assisting in the procurement of our visas.

In the refugee program, Dr. Omar, the Medical Coordinator for COR, demonstrated great support and interest in the vitamin A activities. His staff member, Ms. Zarah, who leads the MCH activities was a great help to the evaluation team, especially in the visits to the various refugee camps. The UNHCR Nutritionist, Ms. Rita Bhatia, exemplified the best of international support personnel and provided us with the necessary background and contextual setting which put the vitamin A efforts into perspective. In addition, we appreciate the efforts of all the PVO officials who spent time with us describing their refugee relief efforts.

We must also thank Dr. Solomon Iyasu, Country Director for HKI, who made all the logistic arrangements, generally "made things happen" and accomplished the evaluation team. In the HKI/NY office, Ms. Susan Eastman and Ms. Anne Paxton facilitated matters. Finally, we thank Dr. Anita Markie, USAID/Khartoum Health Officer, who met with the team on several occasions and discussed project activities in the context of broader child survival activities.

GLOSSARY

ADRA - Adventist Development Relief Agency
AID - Agency for International Development
ARC - American Refugee Committee
CARE - Cooperative for American Relief Everywhere
CHW - Community Health Worker
COR - Commissioner's Office for Refugees
EEC - European Economic Community
farig - Nomadic Group
HIID - Harvard Institute for International Development
HKI - Helen Keller International
IRC - International Rescue Committee
IU - International Units
IVACG - International Vitamin A Consultative Group
JNSP - Joint Nutrition Support Project
LQAS - Lot Quality Assurance Sampling
MOH - Ministry of Health
MVI - Medical Volunteers International
NGO - Non-Governmental Organization
PVO - Private Voluntary Organization
SCC - Sudan Council of Churches
SCF - Save the Children
SERISS - Sudan Emergency Relief Information Surveillance System
UNHCR - United Nations High Commission for Refugees
UNICEF - UN Children's Program
VAC - Vitamin A Capsule
VAD - Vitamin A Deficiency
VITAP - Vitamin A Technical Assistance Program
WHO - World Health Organization

EXECUTIVE SUMMARY

The two-year grant from S&T/Nutrition for Vitamin A Deficiency Control in Sudan (DAN-0045-G-55-6011-00) has made significant progress in advancing the awareness and commitment to vitamin A programming in the country. The grant was originally made to HKI to provide support to the refugees and displaced populations in Sudan. As the situation developed and the HKI program progressed, the effort became more concerned with long-term consciousness raising and capacity building within the Ministry of Health and the Commissioner's Office for Refugees (COR). The most important contribution of HKI was made in the form of developing a vitamin A deficiency prevalence survey methodology, training materials (a manual, flipchart, and illustrated guidelines) as well as emergency and programming guidelines. The materials have been printed and distributed in the two districts where HKI is operating (Northern Darfur and Red Sea) and 346 health workers have been trained in the diagnosis, treatment and prevention of vitamin A deficiency. Post-training test scores improved considerably over the pre-course scores. Site visits made it clear that the health workers appreciated the training, retained most of what they had learned, and had integrated vitamin A knowledge into their work.

As the grant comes to an end, HKI leaves behind a core of health officials in the Department of Nutrition in the MOH who are knowledgeable in vitamin A issues and experienced in operational aspects. In addition, the COR and PVOs working with the refugees in Eastern Sudan have made an impressive beginning in vitamin A programming and have competence to carry out the work in the camps in the future.

While HKI is to be commended for what has been accomplished in vitamin A awareness and capacity building in Sudan over the last two years, a number of recommendations are made that will help the program maintain the momentum that has been developed. The need for a resident HKI adviser cannot be justified, but a number of support activities for HKI remain. The recommendations are divided into short- and long-term activities. The former are extensions of current HKI-sponsored activities which can be included in an additional no-cost extension of the current grant (possibly through mid-1989 if sufficient funds are available). The recommendations include the following:

- assistance in the organization and funding of a national vitamin A workshop to discuss policy and programming issues;
- modification of the training manual to clarify several points;
- printing of 1,000 more copies of the manual, flipchart and guidelines for distribution by the MOH and printing of the manual in Tigrigna for refugee workers in Eastern Sudan;
- publication and testing of the vitamin A story book;
- designing and printing of a vitamin A poster;

- additional and more intensive training emphasizing practical aspects in VAD diagnosis, treatment and prevention with the PVOs working in the refugee camps;
- provision of technical assistance for future vitamin A prevalence surveys.

The longer-term recommendations might be funded from various sources, including VITAP (piggybacking on HKI's technical assistance to U.S. PVOs active in Child Survival in Sudan), USAID (as part of the proposed bilateral Child Survival project), UNICEF (through the JNSP), UNHCR (through support to HKI to provide continuing assistance in vitamin A programming to the refugees). The recommendations include the following:

- formation of a vitamin A unit in the Department of Nutrition (along with training for its head in epidemiology and management) to pursue vitamin A programming;
- provision of approximately three trips a year to provide technical assistance in such areas as survey design and implementation;
- funding to support field activities (per diems and transportation);
- testing of the Lot Quality Assurance Sampling (LQAS) methodology in the refugee camps to determine if it is helpful in establishing levels of VAC distribution;
- inclusion of vitamin A activities in the forthcoming Child Survival Project;
- study of the trachoma problem in the refugee camps to determine if the problem can be addressed and, if so, develop a plan of action.

Site visits to districts and refugee camps where HKI activities have taken place were a vitally important part of the evaluation. Ms. Sheffield visited two areas in Northern Darfur District while Dr. Pyle observed program activities in Sinkat District of Red Sea Province. Discussions at the service delivery point primarily with Community Health Workers made it possible to ascertain the effectiveness of the HKI-supported activities as well as provided an opportunity to identify and explore what type of HKI support might be considered in the future.

The evaluation report will consist of separate chapters on the Nutrition Department and refugee activities. While these two elements of the program have certain similarities, they are administered separately, have different objectives and approaches and, therefore, must be considered as individual components. The final chapter of the report contains conclusions drawn by the evaluation team, recommendation for program improvements and possible directions that might be followed in the future.

I. INTRODUCTION

As specified in the Terms of Reference for the Final Evaluation of HKI's Program of Nutritional Blindness Prevention Control for Drought Victims in Sudan (Attachment I), the evaluation team was requested to address two major issues. One focuses on what has been accomplished during the two-year grant (in accordance with objectives, adequacy of support, constraints, sustainability). The second looks ahead at what, if any, support HKI might provide in the future to prevent and identify/treat vitamin A deficiency in Sudan.

At the very beginning attention must be drawn to the variation between what was originally intended for this program and what has actually transpired. As conceived, HKI was to continue the work carried out with funding from the U.S. Foreign Disaster Assistance Office, that is vitamin A deficiency treatment and prevention among the refugee populations in east and west Sudan as well as among displaced Sudanese populations. The project was viewed as relief, and impact was viewed in a short-term perspective. As the program developed and evolved, HKI to its credit has carried out a program which not only achieved the short-term objectives but has developed an institutional capacity within the Ministry of Health which has as good chance of having long-term impact in the country. A capability to deal with vitamin A issues now exists in the Ministry. This evolution is responsible for the confusion over the title of the program; the original grant title of "Program of Nutritional Blindness Prevention/Control for Drought Victims" does not reflect what the project has actually done. Thus a new title "Program of Vitamin A Deficiency Control" is currently being used, reflecting the broader nature of the HKI effort.

The review of Program activities took place between mid-November and mid-December 1988. The core team, consisting of Victoria Sheffield of HKI (Director of Training) and David Pyle (JSI Consultant) each spent a week in country alone with a week in the middle (29 November to 5 December) when they overlapped. Ms. Sheffield visited Northern Darfur Province where she reviewed the training activities while Dr. Pyle did the same in the Red Sea Province. The core team met with Nutrition Department (MOH) and COR/UNHCR officials and visited refugee camps together.

The methodology used in this evaluation consisted of several elements. Program documents were reviewed. This included the grant agreement, annual program reports, survey methodology and findings, trip reports as well as government and COR/UNHCR materials. In addition, considerable time was devoted to interviewing the government officials who had participated in the vitamin A deficiency control program. Officials at HKI and the central, provincial, district, dispensary and primary health care unit levels of the MOH were interviewed (see Attachment II). Community members in Northern Darfur and Red Sea were chosen at random and their knowledge of program activities investigated. Questionnaires have been developed by HKI/NY to determine the effectiveness of their training programs and they were utilized in Sudan as well as part of the evaluation. Separate questionnaires are used for government counterparts, nurses, community health workers and community members.

II. BACKGROUND

HKI's work in Sudan began in 1985 when the agency provided support to the Commissioner's Office for Refugees (COR) and UNHCR to assist the refugee populations. This was funded by a grant from AID, Office of Foreign Disaster Assistance. HKI's assistance to the refugee effort included a rapid assessment survey to determine prevalence of xerophthalmia. This exercise determined that levels were far in excess of WHO minimum prevalence criteria resulting in HKI providing vitamin A capsules for distribution in refugee reception centers and settlement camps. In addition, HKI developed guidelines for treatment of vitamin A deficiency, provided training materials and conducted training sessions for the international Private Voluntary Organizations (PVOs) and Sudanese health staff responsible for the refugee population.

The early HKI missions to Sudan (January, June and September/October 1985) thought in terms of targeting three population groups for vitamin A prophylaxis and treatment - the refugees in Eastern (from Eritrea and Tigray in Ethiopia) and Western (from Chad) Sudan, Sudanese displaced by drought, and the population of drought-affected Northern Darfur Province.

Among the approximately 24,000 Chadian refugees, the health personnel in the refugee camps were trained in the prevention, identification and treatment of vitamin A xerophthalmia. Xerophthalmia prevalence rates were low, but this was believed to be related to the high mortality rates among the starving people. Because the health and nutrition status was so poor, Vitamin A was still distributed according to the guidelines for prevention of xerophthalmia.

In 1986, all displaced Sudanese camps in Darfur, Kordofan and Red Sea Provinces were closed. This eliminated HKI programming for these groups as well. Surveys of the under age 15 population and pregnant/lactating women in the Eastern Sudan refugee camps during January and July 1985, demonstrated a serious vitamin A deficiency problem. At this time, Sudan had over three quarters of a million Ethiopian refugees, approximately 430,000 in the camps. With HKI support in May and again in September, a total of almost a quarter million capsules (200,000 I.U.) were distributed to children under age 15 and lactating women. This population along with the drought-affected population of Darfur became the focus of HKI attention.

Prior to initiating their Vitamin A Deficiency Control Program in late 1986, a portion of HKI's energies in Sudan were devoted to testing of a liquid vitamin A dispenser. It was thought this would be very useful in servicing large populations; however, the oily base of the vitamin A made this messy and less appealing. They also studied the trachoma problem and explored ways to intervene to respond to this pressing concern. At the same time, HKI held discussions with officials in the MOH, Nutrition Department, UNHCR and the PVOs responsible for service delivery in the Eastern Sudan refugee camps as well as USAID/Khartoum. The consensus was that a genuine need for HKI services existed in Sudan. A proposal for the Nutritional Blindness Prevention Control Program for Drought Victims in

Sudan was drafted by HKI and submitted to AID in March 1986. A two-year grant from AID starting in September 1986 was the mechanism by which this assistance was to be provided.

A. Grant Agreement (September 1986)

The grant agreement (see Project Description, Attachment III) did not include any reference to trachoma since AID did not view it as a Child Survival intervention. Because the funding for the HKI Vitamin A Deficiency Control Program in Sudan was supported out of Child Survival funds, trachoma activities could not be justified despite a severe problem with the disease in the country.

The agreement made reference to two activities which have not been pursued. One was in the area of research, i.e., to determine serum vitamin A levels in children having various deficiency signs. Moreover, various dosage levels were to be given to children with diarrhea to compare serum vitamin A levels. The research was not carried out because of the delay in getting the program underway and the difficulty of collecting and analyzing blood samples in a country like Sudan where transport and communications are so difficult. The Nutrition Department concurred in the scaling down of program activities.

There was also a mention in the grant agreement that HKI would investigate the feasibility and cost-effectiveness of fortifying sugar with vitamin A in Sudan. It quickly became apparent that the processing of sugar (multiple sites) and various irregularities (eg., smuggling) precluded an effective fortification effort.

B. Program Start-Up

While the HKI Country Director arrived in Sudan in mid-September 1986, no agreement was signed with the Ministry of Health until late February of 1987. The primary reasons for the six-month delay were political. This was a period of transition from a military to a democratically-elected government with changes in regulations, directors and organization. Once the government's "Technical Committee" responsible for reviewing PVO program proposals was reconvened, a six-month license to operate was granted and an agreement could be signed with the MOH.

Another reason underlying slow progress in initiating and carrying out program activities is logistic difficulties. This is especially true for the Northern Darfur area. With no paved roads, it takes 6 to 10 days to drive to El Fasher (capital) during the dry season; it is impossible to reach overland during the rainy season. In addition, there is a perennial shortage of fuel and authorization is required to purchase it when it is available. Air travel is unreliable at best and railroads do not exist, therefore are not viable alternatives. Moreover, telephones do not exist or do not function. All this makes it extremely difficult to function in a large country that is three times the land mass of Texas. Because of an established transportation network of planes and vehicles being used by other PVOs and offered to HKI upon request at the time of the proposal submission, HKI had planned to make use of this network in carrying out

activities. However, when the drought was over, many PVOs pulled out of Sudan and others scaled down activities basically stopping this regular transport network greatly affecting HKI's transportation requirements.

The delay in initiating program activities made it necessary to modify program objectives (see Attachment IV, as stated in HKI's First Annual Report). Activities now focused on conducting a vitamin A deficiency assessment survey in North Darfur and to reduce the prevalence of vitamin A deficiency in the target population through the distribution of megadose vitamin A capsules. In addition, health workers in Northern Darfur and the refugee camps of Eastern Sudan would be trained in the detection, treatment and prevention of vitamin A deficiency. Finally, a monitoring system would be developed and put into operation.

Because of the delay experienced in launching project activities, USAID/Washington was requested by HKI to grant a six-month no-cost extension. This was granted (Attachment V), allowing the Vitamin A Deficiency Control Program to continue until the end of February 1989.

C. Finances

The Grant Agreement of September 1986 called for a total budget of \$702,006 to carry out the Vitamin A Deficiency Control Program. Of this amount, HKI was to provide \$244,174 (or 34.8%). The major line items were salaries and fringe (22.4%), supplies (36.8%) allowances (15.6% and travel (16.6%). [1]

To date the project has spent approximately \$30,000 of the \$130,000 budget for the last six months of the project (September 1988 to February 1989). The exact figure is not available as all expense reports and costs for wrap-up activities have not been received. Although two and a half months remain in the life of the project, the country director plans to leave at the end of December 1988, thus reducing costs. Other projected project costs are minimal (eg., remaining training sessions in Red Sea Province). It is likely that approximately \$50,000 will remain at the scheduled completion date of the project.

[1] Money was saved when the Country Director decided against hiring an expatriate project administrator and instead hired a Sudanese administrator. The project has not suffered as a result of this decision.

III. MINISTRY OF HEALTH VITAMIN A ACTIVITIES

During the development stage of the Nutritional Blindness Prevention Program in Sudan, HKI and the Ministry of Health proposed that a vitamin A intervention program would be developed in drought-affected areas of the country. These were identified as Darfur and Kordofan Regions and Red Sea Province. Plans called for the periodic distribution of megadose vitamin A capsules (VAC) to at-risk children using the government's existing health care infrastructure. However, by the time the project became operational (following 6 months for approval by AID and another 6 months to acquire government permission to operate in Sudan) and due to changes in the PVO transportation network described earlier, it became necessary to scale down and revise the HKI efforts. The revised plan of action called for assistance to Sudanese in Darfur Region and technical assistance upon request from regional MOH officials in Red Sea and Kordofan Provinces.

The counterpart for HKI in Sudan is the Director of the Nutrition Department. Three Nutrition Officers have been seconded to work with HKI. All three of the MOH nutrition officers completed the vitamin A training course given by HKI in Khartoum.

Project activities with the MOH have taken place in Northern Darfur Province (population 1,535,526)^{1 2)} and in Red Sea Province (population 920,407); they will be described in separate sections of this chapter. The third section of the chapter is devoted to findings regarding the effectiveness of the HKI work in these two areas. Finally, other forms of HKI support to the MOH and other groups is discussed. In Kordofan, the Regional Director of Health Services did not request HKI assistance. The Directors General for Health in Sudan act very independently, in a decentralized manner, and in the case of Kordofan, they decided they would do the vitamin A survey on their own. According to those who have seen the results of the survey, their sample was large yet was unrepresentative of the province's population. They did not utilize the survey guidelines developed by HKI in Northern Darfur which not only reduces the validity of their findings but also precludes comparisons.

A. Northern Darfur Province

1. Survey - The first activity planned for Northern Darfur Province was a survey to determine the prevalence of vitamin A deficiency (VAD). The only existing data came for a SERISS survey which included data for six regions in 1986 and 1987. It only identified night blindness in children under five; no ocular examinations were carried out. Night blindness is difficult to quantify, is more subjective and, as a result, is prone to bias. In order to assess the level of xerophthalmia in the province, therefore, it became necessary for HKI to carry out a survey. This would also provide baseline data against which program performance could be

^{1 2)} 1987 project population in the case of the Red Sea population 38.1% of this figure represents Port Sudan Town Council.

measured. To limit time and financial commitments, a rapid assessment survey was scheduled to be carried out in November/December 1987. This corresponds to the pre-harvest season, the time of highest risk of vitamin A deficiency. A sample of more than 1,900 children under the age of 6 were to be surveyed, divided proportionately between urban and rural populations.

A detailed Operational Procedures Manual was prepared by HKI/Khartoum for the Northern Darfur xerophthalmia assessment. The survey protocol and field manual were developed in June 1987 with the assistance of the HKI/NY epidemiologist. It gave the district-wise breakdown, detailing the number of urban quarters, village councils and farigs (nomadic groups), sample size calculations and random sample design (including alternative sites), survey team members, survey equipment, child interviews and ocular exam forms. Attachment VI provides copies of the two survey forms.

The survey was conducted in 9 sample sites (8 rural and 1 urban) in five of the six districts of the province during February - March 1988. The survey was delayed four months due to the failure of the Darfur MOH to deliver two vehicles. Finally, HKI was forced to send its vehicle from Khartoum while the survey was being conducted.^[3] Moreover, poor communications and fuel shortages made it impossible to carry out the survey according to schedule. One district, Kebkabiya, could not be included due to security problems. The survey found 10 cases of nightblindness (rate 0.52%) and one case of Bitot's spots (0.05%). Seven corneal scars were identified, two having been associated with VAD and measles during the drought. When compared with the minimum prevalence criteria established by WHO, the current prevalence of active xerophthalmia was found not to be a significant public health problem in Northern Darfur Province. Although not widespread nor serious during normal times, certain pockets of mild xerophthalmia do exist. Interviews with the mothers revealed a number of different local terms for nightblindness and a high incidence rate during droughts.

HKI and the Nutrition Department of the MOH developed a strategy which relied on the training of local health workers (Community Health Workers - CHWs, Medical Assistants, nurses and health visitors) in the targeted districts. The training would emphasize the recognition, treatment and prevention of vitamin A deficiency by the frontline health workers so that they could respond to emergencies when they arose and distribute prophylactic and treatment dosages of vitamin A as required. Treatment was to be made available at all peripheral health facilities (primary health units) to ensure that VAD could be addressed when and if it occurred. Finally, a monitoring system was required to identify impending famines or man-made disasters which might precipitate an increase in the prevalence of VAD and trigger appropriate control and prevention interventions.

[3] Although three vehicles were included in the original HKI proposal and budget, HKI/NY never approved the purchase of more than one vehicle despite requests from HKI/Khartoum.

2. Training Materials - To achieve the objective of developing an institutional capacity to identify, treat and prevent vitamin A deficiency, HKI and the Nutrition Department collaborated in the development of training materials. Three different items were produced and given to each trainer to retain.

- Training Manual: The manual is to serve as the basic textbook and reference for the local health workers. It defines vitamin A deficiency and xerophthalmia, describes the risk groups and contributing factors, identifies eye signs and symptoms, explains the treatment and prevention of xerophthalmia, provides information on nutrition education in prevention of VAD and reviews recording and reporting procedures for vitamin A activities. Attachment VII is a translated copy of the Manual. 1,000 copies of the manual were printed in Arabic in Egypt to save money and improve quality (especially a long-lasting cover).
- Flip chart: This visual aid consists of 19 pictures portraying nutritional blindness and visual impairment. It relates these to consumption of vitamin A-rich foods. It is used by the CHW in the instruction of community members on the prevention and treatment of vitamin A deficiency. Attachment VIII is a selection of the pictures from the flipchart. 1,000 copies of the flipchart were produced.
- Guidelines: This is a concise ready reference on vitamin A deficiency to be used by CHWs and posted in the health care units. It defines xerophthalmia, explains its importance, gives signs and symptoms (illustrated by colored pictures), describes treatment and prevention and lists foods rich in vitamin A. The information is given in Arabic on one side and English on the other (see Attachment IX).

HKI has also developed a story book on vitamin A in Arabic complete with illustrations, entitled Ahmed "Shileil" and his sister Aisha "Oum Eioun" (see Attachment X). It has supposedly been well received in Sudan by those who have seen it, but as yet it has not been tested or printed in volume. The same story developed in Sudan has been utilized by HKI in their programs in Malawi and Niger.

3. Training of Health Workers - The HKI Country Director, with the assistance from the Nutrition Department Officers who had completed the vitamin A trainers' course, trained three Ophthalmic Medical Assistants at the CHW School in El Fasher in Northern Darfur as trainers in vitamin A detection, treatment and prevention. These workers were seconded to the project by the Director General of Health in Darfur Region who has primary responsibility for overseeing project activities, assigning and supervising

MOH personnel and management project funds for activities in the region. They in turn toured five districts of the province training 207 community health workers, medical assistants, nurses and health workers. No village midwives were trained. El Geneina District, in the southwestern corner of the province, could not be reached due to inaccessibility caused by heavy rains. Table I gives a breakdown of the health workers trained by district:

Table I

Number of Health Workers Trained in Northern Darfur Province
(by district)

<u>District</u>	<u>CHWs</u>	<u>MAs</u>	<u>Nurses</u>	<u>HV</u>	<u>Total</u>
El Fasher	35	28	1	15	79
Kebkebia	28	9	3	0	40
Kuttom	18	13	3	1	35
Um Kedada	23	13	1	0	37
Mellit	5	10	1	0	16
TOTALS	109	73	9	16	207

CHW= Community Health Worker

MA= Medical Assistant

HV= Health Visitor

As standard practice, pre- and post-tests (consisting of 20 questions) were administered to the trainers. In the Northern Darfur Province average pre-test scores improved by almost a third in the post-test. Attachment XI is a copy of the pre/post tests administered to the trainers. Table II gives the results by district.

Table II

Pre/Post Test Scores of Health Workers Trained in
Northern Darfur Province
(by district)

<u>District</u>	<u>Pre-test Score</u>	<u>Post-test Score</u>	<u>% Improvement</u>
El Fasher	12.4	17.9	44.4%
Kebkebia	14.5	17.9	23.4
Kornoy	12.4	15.9	28.2
Kuttom	15.4	18.1	17.5
Seraf Omra	17.6	19.9	13.1

4. Findings - The targets established during the first year for Northern Darfur Province included both vitamin A coverage and training activities. In the former, HKI expected to reach 60% coverage in the first cycle of mass dosing. In addition, 90% of all health facilities in the province were to have adequate and timely supply of vitamin A capsules. However, because the survey found little evidence of xerophthalmia, and the decision was made not to initiate a vitamin A supplementation program, these two elements were no longer valid.

The target for training, however, is valid. HKI was to train over 90% of the community health workers, medical assistants and nurses. According to HKI records and site visit verification, all the targeted health personnel at the service delivery level have been trained and have a highly satisfactory level of knowledge on the diagnosis, treatment and prevention of vitamin A deficiency. Logistic problems (roads closed due to rains) precluded training of the health staff in El Geneina District.

Generally, the health staff members in Northern Darfur found the training and associated materials to be very good. An outline of the 3-day training course can be found in Attachment XII. A minor concern was raised about the manual which had two diagrams reversed and some paragraphs out of place. This was due to the fact that they were printed in Egypt and it was not possible to proof the final layout before printing. The flip chart was used and appreciated as part of the training process, by the trainers as well as the trainees. However, it was not being used by the CHWs in community education. In fact, CHWs rarely do community education and because VAD is not a major problem in the area, it is not a priority. As a result, villagers interviewed had not heard of vitamin A. They did know however, about "jahar", the local term for night blindness, but did not know that it was caused by lack of vitamin A nor that it can be cured by eating Vitamin A rich foods. Some mothers thought that milk cured "jahar" because children got "jahar" during the drought when the animals died and milk was not available.

The delay in carrying out the survey in Northern Darfur raised a potential problem. It was originally scheduled for the pre-harvest (hunger) season (November-December) but was carried out in February (post-harvest). Intuitively, one would assume this would give results that did not reflect the actual situation.

More importantly, the delay in the survey meant the training was carried out prior to knowing the survey findings. Training could have been tailored to survey findings if they had been available. In fact, there is a good possibility the training resources would have been placed elsewhere where the problem of vitamin A deficiency was greater. Nonetheless, considering that pockets of VAD were identified in Northern Darfur and that droughts are cyclical, raising the awareness of vitamin A in the province and instructing health workers how to identify, treat and prevent VAD was worthwhile.

B. Red Sea Province

1. History - While vitamin A deficiency has been known to exist in the Red Sea Province for some time, the drought of 1983/84 made it a priority health problem that needed to be addressed as part of the general nutritional relief and rehabilitation program in the province. The MOH and Oxfam initiated a vitamin A capsule distribution program through the government health service infrastructure (dispensaries, health centers and to some extent primary care units). Problems arose because health workers were not trained in the identification, treatment or prevention of xerophthalmia and the program was poorly coordinated and monitored. The capsule distribution program ended in 1987 when the MOH and collaborating PVOs disagreed over how the program was to be run.

2. HKI 6-Month Action Plan - To rectify the problem, HKI wanted to determine the extent and location of the VAD problem, train the workers to treat and control it, and develop a reporting system. In April 1988, two nutrition officers from the Nutrition Department in Khartoum visited the Director of Health Services for the Red Sea Province and explored possibilities of initiating a VAD intervention program. They agreed in principle that a survey was required to determine the magnitude and geographic distribution of xerophthalmia in the province. At the same time, the local MOH staff had to be trained in the recognition, treatment and prevention of VAD. Based on the survey results, a strategy would be developed. A six-month support project was drafted to carry out these steps.

The Action Plan for the six-months of support activities, written collaboratively with the Provincial health staff, was divided into two phases. Phase I (July - September 1988) was to consist of the Training of Trainers, two from each of the eight districts. Secondly, a vitamin A deficiency prevalence survey was to be developed, data collection teams trained and mechanics tested. During Phase II (last quarter of 1988) they were to carry out and complete the assessment survey, analyze its data and write-up the findings. In addition, district level training of health workers was to be completed by the district training teams. Finally, the intervention strategy was to be developed.

3. Findings - The survey design, sample size determination and random sample selection for the Red Sea Province was developed at the same time as the Northern Darfur survey. However, due to a lack of cooperation of the Director of Health for the Province who withdrew his verbal agreement to the scheduled activities, the survey has been delayed. No teams have been trained for data collection to date. When the Director for Health asked when it would be possible to carry out the assessment, the answer was after Ramadan, sometime in May of 1989. January/February was not considered possible due to planning exercises which will dominate people's attention. The director complained that 45 days is more than he can afford to let his officials be away from their jobs. The HKI representative assured him that it was possible to halve the amount of time required.

More progress was made in the training of the district trainers. The two nutrition officers from the Nutrition Department of the MOH in Khartoum visited Port Sudan during the first half of August and gave 16 trainers four days of training. The trainers consisted of dispensary inspectors (9), medical assistants (4), CHW tutors (3). The pre-test scores improved 24.8% in the post-test where the average score was 18.6 (out of a possible 20).

The trained trainers then carried out one round of training of health workers in their respective districts. Because no health workers were trained in Port Sudan urban areas, only seven training sessions were held. The list of workers to be trained by district and position is provided in Table III.

Table III
Number of Health Workers to
to be Trained in Red Sea Province
(by District)

	<u>MAG</u>	<u>MAE</u>	<u>Nurses</u>	<u>Health Visitors</u>	<u>CHW's</u>	<u>Total</u>
S. Tokar	6	1	6	-	42	54
N. Tokar	2	-	2	1	26	31
Sinkat	3	1	1	2	37	44
Haya	4	-	3	-	28	35
Derudeb	2	-	2	-	24	28
Halaib	5	-	6	1	28	40
P. Sudan R.	5	-	7	-	28	40
P. Sudan T.	<u>13</u>	<u>11</u>	<u>18</u>	<u>19</u>	<u>5</u>	<u>66</u>
TOTAL	40	13	45	23	218	284

*SOURCE: MOH - Port Sudan (1988).

MAE = Medical Assistants - Eye
MAG = Medical Assistants - General

The persons interviewed who had been trained by the Nutrition Officers from Khartoum had a high regard for the manner in which the sessions were conducted. The only minor complaints heard were that the women were young and assumed they knew considerably more than the older men being trained. More importantly, a comment was made that the training was strong in the theoretical aspects and less strong in the practical/operational side. It was difficult to find cases with the various stages of active xerophthalmia for the trainees to examine and identify the status for themselves; cases

of VAD usually only exist in the villages, and the perennial problem of lack of transport makes it difficult to locate/transport them to the training site or to take the trainees to the village.

A total of 139 health workers were trained in the 7 sessions. The pretest scores indicate that the information had been transferred as the mean score rose from 14.2 to 18, an increase of 26.8%. Table IV summarizes the dates of training, the number of trainees by category, pre/post test scores and percentage increase, and number remaining to be trained.

Table IV
Pre/Post-Test Scores of Health Workers
Trained in Red Sea Province
(by District)

District	Date of Training	Number Trained		Mean Test Scores			# to be trained
		MA	CHW	Pre	Post	% Incr.	
Halaib	20-23 Sep	2	18	10.9	15.5	42.2	20
Derudeb	10-12 Sep	-	14	13.8	18.1	31.2	9
N. Tokar	24-26 Sep	4	16	14.5	18.4	26.9	11
Haya	27-29 Oct	-	20	14.3	18.8	31.5	15
Sinkat	17-19 Nov	-	20	15.4	18.8	22.1	24
S. Tokar	24-26 Nov.	3	17	NA	NA	NA	34
Port Sudan Rural	26-28 Nov	-	20	16.5	18.1	9.7	20

The remaining 133 health workers will be trained early in 1989.

In a site visit to Sinkat District, the local health workers that were trained by the district level trainers were knowledgeable on the various aspects of identification, treatment and prophylaxis of vitamin A deficiency. They all had the materials (the manual, flipchart and guidelines). Several of the primary health units had the guidelines mounted on the wall. One enterprising CHW had two copies of the flipchart hanging in his unit, one turned to the picture illustrating nightblindness, the other to the illustration of the vitamin A-rich foods. He did not say how he had procured a second copy, but he said that these two pictures were the most important ones to convey the message about nutritional blindness. The same CHW reinforced the message of proper diet during his home visits. His effectiveness was demonstrated by the fact that husbands complained that their wives were spending too much on vegetables at the market. Once the CHW got through lecturing them on the importance of these foods, they too became converts!

The health workers visited were also following recording/reporting instructions as given in the training course. For example, a Medical Assistant was keeping outpatient records. Although case definition left something to be desired, the Medical Assistant at Arkowit Dispensary began recording vitamin A deficiency cases in his outpatient register classified by sex and age, after he had completed the vitamin A training course in early August. From mid-August through the end of November, he had identified 99 cases.

In terms of ways to improve the materials and training, several issues were raised. For one, there was not enough practical training. Again the difficulty of locating cases with VAD close to the training site was mentioned. Secondly, there was not a clear idea of why megadose vitamin A was not given to the pregnant women or only once to the lactating women. One CHW was continuing to provide VACs to lactating women so that their breast-fed babies would receive a vitamin A supplement. The danger of the mother being in the early stage of pregnancy was not evident to the CHW. In addition, the desire for a poster portraying vitamin A deficiency that could be displayed in primary health units, schools, shops, etc. was mentioned. Some innovative health workers are using the guidelines and flipcharts in just such a way at present, apparently with some success.

One problem in Sinkat arose when the ophthalmic Medical Assistant was not chosen as a district Trainer. Unfortunately, he was not available at his post when the Provincial Health Director chose the district trainers. He is very experienced and knowledgeable on vitamin-A related eye problems. Because he was not included as a trainer, his cooperation (e.g., finding cases of VAD to use in the practical training) was not forthcoming. Moreover, training him would have helped institutionalize vitamin A deficiency diagnosis, treatment and prevention in the district. Only one other district has a medical assistant for eyes. He also was not chosen as a district trainer. The district-level officials who select the district-level trainers could have improved the effectiveness of the program by including the existing ophthalmic MAs as district trainers.

Generally, the approach of training district trainers in the Red Sea Province was found more efficient than having a central team train health workers in each district as was done in Northern Darfur. The former approach also increases the possibility of institutionalization since each district has two qualified trainers who can reinforce the training in the future with periodic in-service training sessions and field supervision.

The approach of training two trainers from each district is a significant improvement, more expeditious and cost-effective, over the strategy used in Northern Darfur. If the Red Sea approach had been employed in North Darfur, the sixth district could have been covered since they would not have had a provincial team going from district to district and logistic concerns would have been eliminated. HKI learned from this experience and modified their approach, reducing the time required and limiting the amount of movement needed to get trainers from district to district. The tradeoff is less supervision and control by the Nutrition Office, but the site visit to Sinkat demonstrated that the district-level trainers had done a good job in transferring the information on the diagnosis, treatment and prevention of vitamin A deficiency. Hence the

alternative approach proved to be an improvement. An additional advantage is that several health staff members are now available at the district level to monitor and reinforce vitamin A activities in the future; moreover, if any emergency were to arise, they could be mobilized. A final consideration is logistic ease; by scheduling the training sessions for the end of the month when workers from the outlying posts have to come to the district hospital to collect their pay, transport costs and time away from post can be minimized.

C. Other Activities

In addition to the specific provincial support activities in Northern Darfur and Red Sea, HKI has played a general facilitating role which has increased the awareness and support for vitamin A programming in Sudan. In the mid-1980's when HKI first began working in Sudan, the country was not considered to have a significant vitamin A deficiency problem. It is now widely recognized that not only does Sudan have a problem, but approaches are available and tested in Sudan to address it.

One way that the vitamin A consciousness has been raised in Sudan is by HKI sponsoring the participation of leading Sudanese health officials in international vitamin A meetings. For example, HKI sponsored the Director of the Nutrition Department so that he could attend the 10th International Vitamin A Consultative Group (IVACG) meeting in Addis Ababa in 1987. In addition, at the recommendation of HKI, UNICEF sponsored the deputy director of the Nutrition Department to attend the same meeting.

HKI also provided technical and training assistance during the floods of August 1988. HKI assisted the Nutrition Department in the preparation of the "Emergency Nutritional Resource Operating Plan of Action" providing guidelines on vitamin A distribution. One page of a 14-page booklet labelled "Nutrition Emergency Guidelines" was included on vitamin A (Attachment XIII). This included the blanket distribution of one megadose of vitamin A to children under five and treatment (3 doses) for children with signs of xerophthalmia, measles, severe malnutrition or chronic diarrhea. In addition, HKI provided 440,000 megadose capsules, including the first 40,000 capsules from in-country stock, for emergency distribution.

Finally, HKI serves as an advisor on vitamin A matters for any group interested in initiating vitamin A activities in Sudan. Although not in HKI/Khartoum's scope of work to assist U.S. PVOs implementing Child Survival projects, they have been willing to help when requested.^[4] CARE, for instance, has requested HKI's assistance in designing a survey of vitamin A deficiency prevalence (at the same time as its EPI coverage survey) in its Child Survival program in two districts of Kordofan and assistance in training its workers. These are the two aspects upon which

[4] HKI has a centrally-funded project (Vitamin A Operational Assistance Project) to assist U.S. PVOs having Child Survival projects in 6 countries of Africa but Sudan is not one of them. Sudan, however, is included as a country to receive assistance under the recently granted VITAP.

HKI has focused attention in its work with the Nutrition Department and for which HKI has well established and tested approaches/materials. HKI also hopes to work with ADRA in the Northern Region, but definite plans or strategy have not yet been developed. In addition, HKI has worked closely with the Medical Volunteers International (MVI) who have a health project in one district of Red Sea Province. HKI views these efforts as ways of introducing vitamin A activities into areas where they have not existed before.

D. Recommendations

HKI has succeeded in developing an institutional capacity in the Nutrition Department to address vitamin A concerns in Sudan. The director and several of his staff take a real interest in and demonstrate a commitment to continuing vitamin A activity. With HKI assistance, training materials, methodologies and procedures have been developed and carried out by departmental staff. The need for assessment surveys is now realized by the Nutrition Department, and several individuals are now familiar with data collection and analysis technologies. To the country Director's credit, this has been achieved without salary supplements, the most common way for donor agencies to gain cooperation. HKI has, very justifiably, paid full expenses not covered by the limited departmental budget and which otherwise would have to come out of the worker's own pocket. With this institutionalized capability, there is no longer a need for HKI to maintain a resident advisor in Khartoum. However, it is apparent that support will be required in the future, primarily in the following areas.

- Seminar: There has been considerable work done in vitamin A in Sudan since 1985 by different agencies. There is a need to hold a national seminar where all those with experience in vitamin A (service, diagnosis, treatment, prevention) and the health directors from all the regions/provinces can come together and discuss vitamin A programming. The objective would be to share knowledge and develop greater uniformity of approach utilized by the various organizations.
- Materials: Additional copies of the Manual Flipchart and Guidelines will be required as vitamin A activities are expanded. First, the existing materials, especially the Manual, should have a few minor changes made (e.g., explanation of why pregnant women must not be given megadoses of vitamin A and why lactating women receive only one dose within a month of delivery; a mention of the morbidity/mortality reducing possibility to strengthen interest/commitment to vitamin A programming). Finally, a poster on vitamin A deficiency is needed (possibly depicting common symptoms such as nightblindness and showing readily available, affordable foods that can prevent vitamin A deficiency); support will be required for the design and printing.

- Technical Assistance: The need for periodic (approximately three visits a year) technical assistance will be required to assist the Nutrition Department and various regions to carry out vitamin A program activities. Of greatest importance is assistance in the design and conducting of xerophthalmia prevalence surveys. Guidelines for the surveys should be developed, and published by HKI to serve as a guide, covering such issues as design, sampling, random selection, data collection, questionnaires, logistics, data processing). In addition, funds to carry out such surveys (e.g., per diem, transport fund, data processing) will be required.

- Training: Training following the Red Sea approach (training two officials per district as trainers) will be required in additional provinces. Financial support will be required to fund the expenses; the Nutrition Officer training team (2 persons) and the transport, per diem, and the incidental cost of the training sessions themselves.

- Program Support: Funds to cover full operation (per diem for both training and survey work) will have to be continued since the budget of the Nutrition Department is not able to cover such expenses. In addition, small amounts for such things as printing, stationery and data processing will also be required.

43

IV. REFUGEE VITAMIN A ACTIVITIES

A. Situation

In 1984-85 there was a huge influx of Ethiopian refugees into Eastern Sudan. There was a high prevalence of xerophthalmia associated with malnutrition, measles and diarrhea. HKI carried out assessments of the refugee population during 1985 and found the prevalence of xerophthalmia far in excess of WHO criteria for a significant public health problem. Table V gives prevalence rates in selected camps in Eastern Sudan in four separate surveys in 1985 to 1987.

Table V
Vitamin A Deficiency Signs
(1985-87)

	<u>Who Criteria</u>	<u>1/85*</u>	<u>7/85**</u>	<u>2/87***</u>	<u>3/87****</u>
No. of Children (1-15) Examined		1191	451	621	2081
Bitot's spots (%)	0.5	2.4	7.3	5.3	4.0
Corneal xerosis (%)	0.01	1.7	1.3	0.03	NA
Corneal Scar (%)	0.05	2.4	1.8	2.6	3.2

* Carried out in Wad Kowli and Wad Sherefe

** Carried out in Fau II, Wad Kowli, Wad Sherefe; also found 14.3 % of lactating women sampled (63) had Bitot's spots, 0% had corneal xerosis, 7.9% had corneal scar.

*** Carried out at Fau II and Shagarab II; in Fau II, found 10.5% of pregnant (N = 19) and 6.1% of lactating women (N = 49) had Bitot's spots. There were no corneal xerosis but 5.3% of pregnant women and 8.1% of the lactating women had corneal scar.

**** Carried out in Shagarab II and Safawa

The high prevalence rates prompted HKI to develop a program with the Commissioner's Office for Refugees (COR) and UNHCR. Originally this included the Chadian refugees in Western Sudan as well, but when the prevalence of xerophthalmia there was found to be low, this component was dropped.

One very important contribution made by HKI was the development of vitamin A guidelines. During the height of refugee influx, the prescribed procedure was to give all children under 15 years of age a dose of 200,000 I.U. upon registration and every three months thereafter. Children under

one received 100,000 I.U. HKI was able to standardize dosages. Prior to this, agencies were dispensing varying dosages (e.g., 5,000, 20,000, 25,000, 40,000, 50,000 I.U.s).

B. HKI - Supported Activities

Responding to the problem found in the camps, HKI developed a three-pronged project:

- supply of megadose vitamin A capsules every three months to children under 15 and lactating women;
- train PVOs delivering services to diagnose, treat and prevent vitamin A deficiency;
- develop a monitoring/reporting system for vitamin A activities.

The number of refugees in the camps has dropped from a high of over 450,000 several years ago to approximately 230,000 in 32 camps today. A portion of the original population has returned to their homes while others have moved out of the camps to other locations in Sudan. The current refugee population is divided in two ways - reception centers (5 with almost 74,000 people) and settlements (26 with almost 163,000 people). Attachment XIV gives the population at each camp and the PVO responsible for the respective camps.

In January 1988, 49 people working with the refugee populations in Eastern Sudan received four days of training in the identification, treatment and prevention of vitamin A deficiency. Forty-two of the participants were from the nine PVOs^[5] responsible for delivering services in the refugee camps. Two more were from UNHCR and five from COR.

The training in the refugee camps consisted of only one day which did not allow for practical field work (especially the identification of vitamin A deficiency signs). The information used for training and given to those trained to take with them is found in the "Guidelines for the Prevention of Vitamin A Deficiency and Xerophthalmia - Refugee Centers and Settlements," produced by HKI.

This 9-Page English handout (Attachment XV) gives the information required by the health workers to carry out vitamin A activities in their respective camps. It also served as a basic reference tool for the workers as they trained their staffs in vitamin A identification, treatment and prophylaxis. A shorter 3-page version "Emergency Guidelines for the Treatment and Prevention of Xerophthalmia (Vitamin A Deficiency)" was also

[5] The PVOs are: American Refugee Committee (6), Christian Outreach (3), International Rescue Committee (8), Lalmba (7), League of Red Crescent & Red Cross (2), Rada Barnen (2), Save the Children U.S. (3), Sudan Council of Churches (6), Swiss Red Cross (5).

prepared by HKI (Attachment XVI). The main difference in an emergency situation is that prophylactic doses are distributed every 3 months to all children under the age of 15. The child receives the first dose upon registration along with a measles immunization. This differs from a regular program which is every six months to children under 6 years old.

C. Findings

The targets established by HKI for its refugee program are divided into two elements, vitamin A capsule distribution and training. In the former, HKI aimed to achieve over 90% coverage of the target population in these refugee camps with megadoses (200,000 I.U.) vitamin A capsules. While the situation differed from camp to camp, it was clear that some PVOs were not distributing vitamin A capsules on a regular basis, and overall this target was not being reached. Vitamin A coverage figures for February and June 1988 show two (out of 25 camps reporting) with over 90% coverage. Both these were in camps run by Christian Outreach. A visit to the three camps under their control made it clear why their coverage was so good. They have a very well managed domiciliary outreach program in which each Home Visitor (responsible for 90 families) visits regularly and is charged with distribution of vitamin A capsules to those under six, in the appointed month. The system is a good example of the classic primary health care outreach approach, well supervised, supported and managed.

Two other groups reported coverage figures in the 80s, six in the 70s, six more in the 60s, one in the 50s, four in the 40s, one in the 30s, two in the teens and one below 10% coverage. One explanation given for the lower than expected coverage was the survey methodology. The surveyor asked for the Road to Health Card where the vitamin A capsule distribution was to be indicated. If no card could be produced in a particular home or if the vitamin A distribution was recorded in some other manner (e.g., in a register), it was counted as not having received vitamin A. Thus, it is reasonable to assume that the coverage figures are conservative and represent considerable under reporting.

More disturbing are the PVOs which are not distributing vitamin A capsules. Several explanations are given. One is that the person(s) trained in vitamin A deficiency diagnosis, treatment and prevention has been transferred. Considerable staff turnover takes place in the refugee camps. There has not been any additional training since January, meaning that the PVO is left without a vitamin A-trained person. Without this orientation, commitment and expertise, the vitamin A component of the health program is sometimes dropped.

A second reason is that in some camps, two PVOs provide health services. Responsibilities are split, divided into such activities as under five OPD, MCH, supplementary feeding, well-baby clinics. The vitamin A activity sometimes gets lost in such cases. No one takes explicit responsibility for it, thus, no one distributes the vitamin A capsules. These problems were found in one of the five camps visited by the evaluation team.

The second target of HKI in its refugee program is to have 100% of the camps maintain regular and adequate vitamin A capsule supplies. This did not seem to be a problem. While HKI has provided over 300,000 megadoses of vitamin A capsules in the last two years in support of the refugee program, at present all but two of the PVOs were receiving megadose vitamin A capsules from their respective organizations. The others could get them from COR/UNHCR buffer stocks. In other words, with very little assistance from HKI, this target was being achieved.

It is difficult to assess whether the training target (90% of refugee health workers will attend at least one training session on vitamin A) has been achieved. While a minimum of two representatives from each of the participatory PVOs were involved in the January vitamin A training session carried out by HKI, there is no way to know how many of the PVO health staff members they have trained. In addition, two PVOs (InterAid-having two camps and YMCA-having one) did not participate in the vitamin A training workshop in January for no specified reason. From our site visits and interviews, it is clear that 100% coverage has not been achieved; in one PVO the medical examiners were not able to identify the signs of vitamin A deficiency or give the proper treatment dosages. This was a case where vitamin A was not being distributed and those trained in January had been transferred. The ability of COR to carry out training in and monitoring of vitamin A activities is severely constrained by the lack of qualified personnel. The Health Director and the person responsible for MCH services are good and very supportive of vitamin A activities, but are unable to devote the time required. The MCH coordinator has all child survival activities (CDD, EPI maternal, nutrition, health education, etc.) under her and cannot be expected to devote great amounts of time to any one intervention. What is required is a health training unit made up of two or three persons who would train PVO staffs in vitamin A amongst other things. The same is required for monitoring. A person who would maintain a surveillance on the delivery of child survival services like vitamin A and follow-up lagging performance when it is reported or when no reports are submitted. The difficulty of getting health staffers to come and work in Eastern Sudan was raised. While acknowledging the difficulty, the need cannot be denied. There is also a problem with transport; however, COR has a large number of vehicles - it is a matter of how they choose to allocate them.

Another problem arising with the monitoring system is the precise definition of xerophthalmia signs and how they should be counted. The number of cases reported from the various camps varies tremendously. One reason is that some PVOs report Bitot's spots and corneal scars (found most often in the older age groups) on a repeated basis. Since corneal scars and some Bitot's spots do not respond to treatment, the number of corneal scars reported becomes cumulative and, as a result, misleading as an indicator of currently occurring vitamin A deficiency cases. If signs are not reported separately, they should at least have corneal scars separated out from the rates for other active signs if those rates are lumped together.

Finally, it became clear from the meeting of PVO health workers that there was little standardization in their vitamin A activities. For example, the target group ranged from under five year olds, to under sixes,

to under tens, to under fifteens. Agencies change the guidelines at their own discretion based on the strategies of health providers and individual service delivery approaches. This sometimes varies according to mode of distribution with those using mass campaigns and home visitors to distribute to under sixes and those employing MCH or under five clinics to reach children under age five years only. The guidelines are clear and should be followed so that there is uniformity among all the PVO-supported refugee health programs.

D. Recommendations

The refugee program is functioning fairly effectively. Awareness of vitamin A deficiency exists at COR/UNHCR and among most of the PVOs. Moreover, the training capacity and ability to respond to emergency situations has been institutionalized at COR as well as in most of the PVOs working in the refugee camps. Several actions, however, could improve the effectiveness of the program.

- Materials: The COR/UNHCR want to translate the HKI-developed vitamin A manual in the local language of the refugees (in most cases this is Tigrigna) and have copies produced for the refugee health workers. They are willing to translate the manual if someone could support the printing costs.
- Training: There is an obvious need to conduct another training course for new PVO health managers, for those PVOs not receiving training, and as refresher training for those who have received the short introductory vitamin A course. In addition, there is a need to provide a more specialized course (3-4 days) in which a limited number of PVO health workers (possibly one per PVO) would receive intensive training in identification of xerophthalmia signs. Emphasis should be placed on practical field training. The HKI curriculum used in Northern Darfur and Red Sea could be adapted for refugee use.
- Personnel: Although not within the scope of HKI funding, it is imperative that several staff members be added to the COR maternal child health staff to facilitate training and monitoring capacities, including vitamin A activities. This would assure follow-up of lagging PVOs and standardization of vitamin A activities.
- Prevalence Survey: TA is required to help COR carry out a vitamin A deficiency prevalence survey to ascertain the current status of the refugee population.

- Monitoring System: A clear definition must be established as to what cases are reported in the monthly forms. To eliminate the repeated reporting of corneal scars and unresponsive Bitot's spots, for example, only "new cases" should be reported. This will eliminate those cases which do not respond to vitamin A treatment.

- Simplified Monitoring Methodology: Technical assistance should be provided in a simplified methodology to determine vitamin A capsule coverage in the refugee camps. One approach is Lot Quality Assurance Sampling (LQAS) which can determine whether a predetermined level of coverage has been achieved by surveying a very small number of cases.

- Trachoma: The PVOs expressed concern over the high rates of trachoma among the refugee population. A prevalence survey in March 1987 (by David Heiden, Proctor Foundation) found that 21% of those examined from the general population in one camp and 60% in another suffered from active trachoma. Among healthy children in an orphanage, and Koranic and elementary schools in three camps, the rates of active trachoma were very high; out of a total sample of 1171 children, 279 (23.8%) had mild cases while another 295 (25.2%) had moderate/ severe cases. This means that slightly less than half the sample examined suffered from trachoma. With trachoma being excluded from HKI's soon to be completed project and with vitamin A deficiency being more under control at present in the camps, the consideration of the treatment and prevention of trachoma can be justified. An intervention should include the provision of antibiotic (tetracycline) eye ointment, development/production of hygiene education materials and training. But, because so much of the long-run success of a trachoma program depends on proper environmental sanitation, hygiene and sufficient water supplies, no actions should be taken before COR/UNHCR launches serious efforts in these regards.

V. CONCLUSIONS/RECOMMENDATIONS

HKI's Program of Vitamin A Deficiency Control in Sudan has made impressive progress toward realizing its objective of creating an awareness of the vitamin A deficiency problem in the country while developing a capacity to deal with it. It has developed, produced and distributed effective training materials, developed a capacity to train local health workers and personnel in the refugee camps of Eastern Sudan, developed a methodology for vitamin A deficiency prevalence surveys and completed one such survey, and developed guidelines for emergency vitamin A programming. The HKI Country Director has achieved this with a combination of professional competence, perseverance and diplomacy, in close cooperation and collaboration with the Nutrition Department of the MOH and his counterparts in COR/UNHCR. HKI is to be commended for its performance particularly in view of the extremely difficult times being experienced in Sudan - the refugees from two neighboring countries, hundreds of thousands of displaced Sudanese due to drought and civil unrest, a change in political leadership and the ever-present difficulties associated with operating in Sudan (tremendous distances, lack of communications and transport facilities).

HKI has established a credible foundation for effective vitamin A programming in Sudan. When its current grant comes to an end, HKI will leave behind an awareness of and commitment to vitamin A programming as well as such material support as a vehicle (plus spare parts), office furniture and equipment (typewriter, photocopier and slide projector for training). However, a few relatively minor modifications are recommended and future support will be required if the progress made and momentum developed is to be sustained. The recommendations are divided into two categories: the first set consists of short-term issues which concern modifications of the present program and relate mainly to the comments found in the chapters on the MOH and refugee programs, respectively; the second category involves longer-range issues which the next phase of vitamin A programming in Sudan might consider.

A. Short-Term Recommendations:

It is suggested that the short-term recommendations can be supported by the funds remaining in the two-year grant. It is recommended that an additional no-cost extension of three months be approved by AID to permit the funds to be utilized and the following recommendations carried out.

1. Seminar/Workshop: Considerable progress and work in vitamin A programming has been made in Sudan since mid-1985. There is a need for those involved in vitamin A efforts to share knowledge and to make sure that regional/provincial-level decision makers are aware of various aspects of vitamin A programming (survey methodology and findings, training materials and techniques, diagnosis/treatment/prophylactic guidelines).

2. Manual: Minor modifications should be made on the training manual before reprinting. These include (1) revisions (i.e., changing the order of a few graphics and paragraphs); (2) explaining why megadoses of vitamin A must not be given to pregnant women and only once to lactating women (within a month after delivery); (3) adding monitoring instruction (e.g., do not continue to count corneal scars and Bitot's spots if they do not respond to treatment).
3. Additional Copies: As planned, 1000 more copies of the manual will be produced and left for the Department of Nutrition to distribute to other provinces (e.g., Kordofan) and institutions (e.g., nursing schools, NGOs). In addition, COR/UNHCR expressed interest in translating the manual (plus flipchart and guidelines) into Tigrigna for use in the Eastern Sudan refugee camps. Support should be provided to print several hundred copies of the translated version.
4. Storybook: A limited edition (i.e., 1000 copies) of the Arabic story on vitamin A should be printed and tested in local schools, both urban and rural.
5. Poster: A need was identified for a poster on vitamin A deficiency for distribution to health centers, schools and shops. The poster would create awareness of the problem and reinforce the messages provided by the local health workers. They would be pictorial with no or minimal copy, as in the case of the illustrations in the flipchart.
6. Training: Additional training is required in the refugee camps to cover newly arrived PVO personnel and those not having received the vitamin A course. In addition, more intensive field training in identifying and treating clinical signs of VAD should be conducted for the medical examiners.
7. Surveys: Technical assistance will be required from HKI to carry out the proposed/delayed vitamin A deficiency prevalence survey in Red Sea Province. In addition, financial support to cover expenses in the field (fuel, per diems) will be required. In the refugee program, another prevalence survey is required to ascertain the current level of xerophthalmia.

B. Long-Term Recommendations

Some programming needs will require more time than can be accommodated within the proposed life of HKI's current vitamin A grant. Several possibilities exist for sources of support for these longer-term activities. One is the proposed Child Survival Project USAID/Khartoum is planning for FY 90. Another is to piggyback technical assistance provided to PVCs in Sudan under the recently funded HKI grant, Vitamin A Technical Assistance Program (VITAP). A third possibility is a small grant from USAID/Khartoum to fund on-going support by HKI to the Department of Nutrition and UNHCR to assist COR to assure that the progress made to date is maintained and, when possible, extended. Finally, UNICEF, directly or through the Joint Nutrition Support Project (JNSP) which is currently operating in the Red Sea Province and has just been extended for three years, may also be a source of support for vitamin A programming. Specific HKI activities that can usefully be part of a long-term strategy include:

1. Formation of Vitamin A Unit: The Department of Nutrition has developed expertise in vitamin A programming. This should be institutionalized as a separate small core unit within the Department. Several trainers and a survey specialist will be required to continue the efforts initiated by HKI. The head of the unit is likely to need training in epidemiology (intensive short course) and perhaps management. The unit would identify problems, develop proposals, seek funding, plan and facilitate surveys, organize training sessions and workshops, and oversee integration of vitamin A into child survival interventions.
2. Technical Assistance: Approximately three visits per year by HKI experts should be planned for over the next three-year period. In general these visits would provide technical support, monitor activities and guide such field exercises as prevalence surveys.
3. Field Support: A relatively small amount of funds will be required to support full activities so that vitamin A programming can be spread to other areas of Sudan. The most pressing needs would be to cover the field costs (transport and per diems) of surveys and training efforts.
4. Village Midwives: The Department of Nutrition requested that the village midwives receive an abbreviated version of the vitamin A training in districts where other health workers are trained. This is considered a worthwhile addition since this cadre of workers is in closest contact with the mothers and can have maximum impact on nutrition education and referral.

5. Monitoring tool: The Lot Quality Assurance Sampling (LQAS) methodology to determine if predetermined levels of vitamin A capsule distribution have been attained should be tested in Sudan, especially in the Eastern Sudan refugee camps. A copy of a monograph on the approach is provided as Attachment XVII of this report.
6. COR personnel: There is a pressing need to add to the MCH/Nutrition capability at COR. The MCH/Nutrition Coordinator is unable to cope with all the responsibilities with which she is presently tasked. She requires two trainers who would train PVO and camp health staffs on Child Survival interventions including vitamin A. Secondly, the MCH/Nutrition unit should have a person responsible for monitoring and follow-up of poor performance in Child Survival programs, such as vitamin A. Although HKI would not be able to fund such additional staff, this recommendation is made to stress the importance of COR allocating some of its resources to up-grading MCH/Nutrition capability through increased staff.
7. Child Survival Project: It is important that the vitamin A activities developed under HKI assistance be integrated into any Child Survival effort carried out in Sudan. It should be part of EPI (ensuring that infants receive at least one megadose of vitamin A); CDD/ORT (all children with severe diarrhea lasting more than three days given one megadose of vitamin A); the treatment of measles and severe malnutrition; training curricula for health workers; health/nutrition education (importance of vitamin A and vital importance of the early introduction of Vitamin A rich solid foods); and any mass media health/nutrition education campaign.
8. Trachoma: The high prevalence of and the concern in the refugee camps about trachoma should be addressed. The first step would be a prevalence survey and strategy development exercise. The second step is to determine if COR/UNHCR are willing/able to make a commitment to improve the environmental sanitation, hygiene and water situation to a point where a trachoma control program makes sense. If these steps are taken, HKI should develop a training/treatment program for trachoma, emphasizing the importance of health education and good hygiene. The supply of antibiotic eye ointment could be provided by the

PVOs or UNHCR. Any patient requiring trichiasis/entropion surgery would have to depend on a referral center as this is beyond the scope of any HKI support. Such an effort would have to be coordinated with the Trachoma Center at the Eye Hospital in Khartoum.

In addition, it is recommended that HKI work with Dr. Kamal and his staff at the Department of Nutrition on advice with Dr. Anita Mackie of USAID/Khartoum to propose vitamin A activities for the newly established Vitamin A Unit that might be supported by the Child Survival Grant slated for FY90. Specific strategies should address recommendations 1 through 8. Moreover, as HKI now has an in-depth knowledge about VAD and its patterns in Sudan, specific strategies can be defined and proposed for this grant. Examples include the following:

1. Identification of areas of the country which are vulnerable to serious prevalence rates of xerophthalmia during times of environmental stress or civil unrest. Monitoring of these areas should be on-going with institution of activities to address serious problems should they arise.
2. Identification of areas where the land and water supplies make home gardening a viable option for the general population. Specific strategies such as technical assistance in horticulture and social marketing should then be proposed.
3. The Department of Nutrition is well equipped to provide training about vitamin A foods, recipes, and weaning practices. A program which addresses such training strategies for various areas of the country and specific tribes (within their cultural practices and resources) should be designed and instituted.
4. Dr. Kamal, who is closely affiliated with the nutrition education programs at the three universities in Khartoum, can assist the Vitamin A Unit to work closely in developing collaborative activities utilizing university students in field work and other activities. Such collaboration is in the interest of sustainability and further creating an awareness of the importance of the vitamin A initiatives that are taking place in Sudan.

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ANNEX V

VITAMIN A SUPPORT PROGRAM

RED SEA PROVINCE

96

ANNEX V

VITAMIN A SUPPORT PROGRAM

RED SEA PROVINCE

ANNEX V

VITAMIN A DEFICIENCY CONTROL PROGRAM

SIX-MONTH SUPPORT PROGRAM
RED SEA PROVINCE, SUDAN

I. BACKGROUND

Vitamin A deficiency has been known to exist in the Red Sea Province based on a number of non-random surveys conducted in the region by various groups; WHO consultants, 1979 and 1981; HKI, 1985; MOH/OXFAM, 1986 to 1987. The problem was accentuated during the last drought of 83/84 which ravaged Sudan and neighboring Sahelian countries. It was following this that Vitamin A deficiency was felt to be a priority health problem that needed to be addressed as part of the general nutritional rehabilitation and relief program in Red Sea province.

Such a program in the form of periodic vitamin A capsule supplementation to children most at risk (0-15 years) was initiated with the collaboration of MOH and OXFAM. It is known that VACs were distributed through the government health services system (dispensaries, health centers and to some extent through primary health units). However, these activities were poorly coordinated and monitored. The government health workers were not trained in the recognition, treatment and prevention of VAD. Moreover, the rationale behind the distribution of capsules was not clearly understood. Except for reports written by the MOH/OXFAM mobile teams, little documentation of the program exists.

To summarize, a few of the most important identified problems are:

1. Poor definition of the Vitamin A Deficiency problem in terms of magnitude and geographic distribution.
2. Health staff untrained to deal with the problem. In addition, health workers were poorly motivated to undertake the preventive capsule distribution.
3. Poor recording and reporting of program activities such as where? how much? to whom? preventive vitamin A capsules were distributed.
4. Absence of standardized training manuals and qualified, trained health workers in the recognition, treatment and prevention of VAD.

Despite all the above problems, VAC distribution did continue up to October, 1987. Because of poor documentation, it is difficult to estimate the number of at-risk children reached by the periodic preventive vitamin A distribution. Finally, the program was reportedly terminated due to disagreements over the conduct of the program activities between the MOH and collaborating NGOs.

The present vitamin A initiative is essentially to revive the program and set it on a solid course with the support of the central Ministry's Nutrition Department and active collaboration of Provincial MOH. The Nutrition Department in Khartoum has been addressing Vitamin A deficiency in Sudan in collaboration with technical and funding assistance from "Helen Keller International", a non-profit private organization.

In April, 1988, a Nutrition Department team of two Nutrition Officers, Miss Ihsan Ahmed and Miss Inaam Babica were sent to Port Sudan to hold meetings with provincial health authorities in particular Dr. Omer Abdella el Faki, Director of Health Services of Red Sea province, to explore possibilities of initiating an intervention program for VAD.

Based on their discussions and the recommendations of Dr. Omer, several meetings were held in the Nutrition Department, Khartoum between Dr. Kamal Ahmed (Department of Nutrition) and Dr. Solomon Iyasu (HKI Country Director). The following consensus was reached between all parties:

1. There is strong evidence that VAD may be a significant public health problem in Red Sea province and needs to be addressed by the MOH and any NGOs with a health intervention program in the province.
2. Although there is a high suspicion that VAD may be a significant problem, its extent and distribution with the province is not well defined. Therefore, a rapid prevalence survey of a representative sample of children should be conducted.
3. That the training of MOH staff (CHWs, Medical Assistants and Nurses, Health visitors) in the recognition, treatment and prevention of VAD be conducted before any capsule distribution is done. The training should equip the trainees with the knowledge and skills to address the problem within their communities, should have a strong motivational component as well as simple recording/reporting methods for program monitoring and evaluation.

4. Once the assessment survey is conducted and analyzed, the Nutrition department -- in particular with the provincial health office -- should be able to draw plans of action and formulate both short-term and long-term intervention strategies for the control of Vitamin A deficiency in the province.

II. PROGRAM GOAL

This document describes a six-month support project to the Directorate of Health, Red Sea Province, specifically in a Vitamin A deficiency prevention program. Though the overall goal a vitamin A intervention program is ultimately to reduce the prevalence of nutritional blindness in the context of this six month period, the program goals are:

1. To train the province's paramedical staff of CHWs, Medical assistant nurses and Health visitors in control of vitamin A deficiency.
Target: train at least 80% of specified health workers.
2. To conduct a rapid baseline prevalence of vitamin A deficiency in Red Sea province.
3. Formulate short and long-term intervention strategies.

III. ACTION PLAN

This six-month support program is divided into two phases:

Phase I - (July, August, September)

1. Conduct training course for TRAINERS. Two from each of the 8 districts will be trained to serve as district Trainer Teams.
2. Preparation of a survey protocol for Red Sea province and train survey teams. Undertake a mock survey to test the mechanics of the survey as well as check that team members understand their tasks.

Phase II (October, November, December)

1. Conduct and complete assessment survey
2. Complete analysis and writing of survey report.
3. Complete district level training of health workers.

4. Formulate short and long-term action plan and intervention strategies for the province.
5. Placement of stocks of Vitamin A capsules for one year's need.

The Principle:

This program as outlined above will be a collaborative effort between the Nutrition Department, and the Red Sea Directorate of Health and Helen Keller International.

IV. INPUTS

Nutrition Department

1. Assign one Nutrition Officer (central MOH) to coordinate and liaise with provincial health authorities and the Director of the Nutrition Department will supervise her/his activities;
2. assign one vehicle for project activities;
3. authorize the provincial Nutrition Officer to act as program coordinator with the concurrence of the Director of Health Services, Red Sea Province;
4. provide timely and prompt support to the Directorate of Health in the area of programmatic and technical support;
5. provide feedback on reports submitted by the Program coordinator, Red Sea Province.

Helen Keller International

1. Provide technical assistance to the Nutrition Department and the Red Sea Directorate of Health in the following areas:
 - design and conduct Training programs;
 - design and conduct an assessment survey;
 - design an effective intervention strategy;
 - design and implementation of a monitoring and evaluation scheme.

2. Provide funds for all costs of training and survey as specified in the agreed-upon budget:
 - Training cost shall include preparation and printing of training materials, actual cost of training sessions including per diem as specified in the budget.
 - Cost of survey that includes expenses in preparation of survey protocol and forms; materials per diems; fuel and cost of analysis and preparation of final survey report as specified in the budget.
3. Provision of one year's supply of Vitamin A capsules for the province.

Directorate of Health, Red Sea Province

1. Assign the provincial Nutrition Officer to be the program coordinator, assisted preferably by a Senior Ophthalmic Assistant.
2. Provide facilities for training and meetings.
3. Provide office space to program coordinator to serve as project office.
4. Assume primary responsibility for Implementation under the supervision and direction of the Director of Health Services, Red Sea Province.
5. Immediate day-to-day coordination of project activities shall be the responsibility of the Program Coordinator.
6. The Director of Health Service shall be responsible for releasing funds allocated to specific program activities and bears primary responsibility and accountability for all funds transfers to his Office from Helen Keller International.
7. All accounting records and entries of expense items and receipts should be kept and monthly reports prepared and sent as per guidelines that will be specified in accordance with standard HKI financial reporting systems.

V. MAJOR ACTIVITIES

1. Training of District Trainer Teams

Two senior Medical Assistants or Inspectors shall be selected by the Director of Health Services to be trained as "Trainers" in their respective districts. Sixteen such people shall be trained (two from each district) for 4 days in Port Sudan by two Instructors from Khartoum. Once the training is completed in Port Sudan, each team goes back to its respective district and is expected to conduct training sessions. It is expected that scheduling and informing health workers for district level training will take a month.

According to the time schedule of activities, the course for "Trainers" will take place between the 8th and 11th of August. District level training should start one month following it and to be completed within two months (hopefully by the end of October, 1988).

2. District Level Training

As described above, the exact time schedules and dates of training shall be determined by each district team in such a way that there is no clash with pre-scheduled health training or health activity that might keep trainees from attending the Vitamin A courses. The number of training sessions in each district shall depend on the number of health workers to be trained. Each class shall have a maximum of 20 trainees. The duration of the course shall be three days and standard MOH training manuals shall be the basis of instruction.

3. Vitamin A Deficiency Prevalence Survey

The survey shall be conducted using a rapid survey design (assessment methodology) developed by HKI and the Nutrition Department. The survey design is planned to include a minimum of 2,000 children from six representative village councils and four urban quarters. The sample represents a proportional sample of rural/urban populations from a randomly selected ten sample sites. The list of village councils and urban quarters was obtained from the 1983 census.

A survey team consisting of five members (clinician, interviewer, enumerator, driver and assistant driver/cook) will first be selected and assembled. They will receive a three day training on the survey design and field protocol including a mock field survey to test the mechanics of the survey.

The team will be self sufficient and travel to all the survey sites according to a predetermined plan. (For more information, refer to the survey field protocol manual.)

VI. TIME SCHEDULE OF ACTIVITIES

Please refer to the table on the next page.

VII. BUDGET

See attachments.

II. BUDGET FOR DISTRICT TRAINING SESSIONS:

Each training session at the district level will ideally have 20 trainees in a class. A budget for each session is given below. Where the number of trainees is less or more the 20, adjustments should be made in the planning stage at the provincial level before funds are disbursed to the districts. Such adjustments should appear in the financial reports prepared for submission to HKI and Nutrition Dept, Khartoum.

<u>Budget Item</u>	<u>Amount</u>
1. Instructor per diems (2 persons) @20.00 pds x 3 days x 2	120.00
2. Trainee per diems @ 20.00 pds x 3 days x 20 persons plus 20 pds/person Tr.Allowance	1600.00
3. Materials	100.00
4. Contingency	<u>100.00</u>
TOTAL per session	1920.00
GRAND TOTAL FOR 14 SESSIONS	<u>26,880.00</u>

III. SURVEY BUDGET:

1. Per Diems for Team Members:		
Interviewer @25.00 pds x 45 days	LS	1125.00
Enumerator @25.00 pds x 45 days		1125.00
Driver @20.00 pds x 45 days		900.00
Asst. Driver/cook @ 15.00 pds x 45 days		675.00
2. Living Expenses (food allowance)		
@ 400.00 pds /week x 5 weeks		2000.00
3. Survey materials (water coolersm cooking utensils, water containers etc)		
		1500.00
4. Fuel @ 3.5 pds/gallon x 352 gls		
		1232.00
5. Oil 8 gls x @50 pds		
		400.00
6. Program support- Directorate of health expenditures in support of survey organisation and conduct		
		1000.00*
TOTAL FIELD BUDGET		9957.00
B. Headquarters :		
1. Per diem Clinician examiner (ophthalmologist)		
@ 100.00 /day x 45 days		4500.00
2. Survey forms and materials		
		1000.00
3. Travel /lodging for Khartoum team		
		3228.00
4. Analysis		
		1000.00
TOTAL HQs		9728.00
GRAND TOTAL		19685.00 19685.00

ANNEX VI

LIST OF MATERIELS DEVELOPED BY THE PROJECT

Training Manual for Trainers

Training Manual for Nurses

Training Handout for Village Health Workers

Training Guide to train Trainers

Training Guide to train Nurses

Training Guide to train Village Health Workers

Pre-Post Test for Trainers

Pre-Post Test for Nurses

Pre-Post Test for Village Health Workers

Vitamin A Food Values List

Children's Story Book

Poster

Pagne Design

Guide for Health Education

Training programs tools list

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