

FINAL REPORT
SUDAN INFANT FEEDING PROJECT
October 1988 - December 1989

NUTRITION COMMUNICATION PROJECT
June 1995
Academy for Educational Development
1255 23rd Street, N.W.
Washington, D.C. 20037

This activity was supported by the U.S. Agency for International Development, Office of Nutrition Contract No. DAN-5113-Z-00-7031-00 (Project 936-5113); through funds provided by the Africa Bureau under PIO/T No.698.0421.50-3-80035.

ACKNOWLEDGEMENTS

This report, is based largely on the final report prepared by Deborah Helitzer-Allen. Robin Anthony prepared the tables.

TABLE OF CONTENTS

	Acronyms	i
I.	Executive Summary	1
II.	Introduction	2
III.	Principal Activities	2
IV.	Major Research Findings	5
V.	Recommendations for Future Nutrition Education Activities	8
VI.	Main Outcomes of the Sudan Infant Feeding Project	9
	ANNEX A: Questions Used to Construct the Ethnographic Research Questionnaires	
	ANNEX B: List of NCP Reports	

ACRONYMS

AED	Academy for Educational Development
KAP	Knowledge, Attitudes and Practices [survey]
MOE	Ministry of Education
MOH	Ministry of Health
NCP	Nutrition Communication Project
SERISS	Sudan Emergency Relief Information Surveillance System
SGNED	School Gardening and Nutrition Education Department of the Ministry of Education
USAID	United States Agency for International Development

FINAL REPORT

SUDAN INFANT FEEDING PROJECT

I. Executive Summary

The Sudan Infant Feeding Project was undertaken by USAID with technical assistance from the Nutrition Communication Project (NCP) during the period between October 1988 and December 1989. The project was initiated to study and make recommendations about (1) the potential for marketing of a commercial weaning food; and (2) improvement of feeding practices for infants and young children through the development of a nutrition education/communication strategy for the Nutrition Division of the Ministry of Health (MOH) in three regions of the country (Khartoum, Gezira and Kordofan). The former component of the project was dropped during the early phases of technical assistance, due to the determination that the marketing of a commercial weaning food was not financially feasible under the economic climate existing at the time in Sudan.

The project was prematurely curtailed due to political problems in the Sudan before the project objectives could be completely realized. Nevertheless, several important research activities were undertaken and completed, including analysis and summarization of data previously collected under the auspices of other USAID assistance in the country, and an ethnographic study in the three regions. The resulting analyses showed that severe regional differences exist in food availability, cultural practices, lifestyle patterns, and access to and listening habits regarding communication channels. These differences constrain national efforts to develop nutrition communication programs. However, there are several topics on which messages could be developed which would benefit the entire population. They include: maintenance and support of traditional breastfeeding practices; frequency of feeding, both at the breast and during the weaning period; feeding of solid foods during illness, especially during diarrhea and measles; and consumption of calories and high protein foods during pregnancy. If funding exists, further household-based research should focus on breastfeeding patterns and on identifying foods which are acceptable during illness.

Despite the early conclusion of the project, several other important outcomes were attained. They include: the training of twenty staff from the Ministry of Education's School Gardening and Nutrition Department (SGNED) in ethnographic research skills; the initial activities have prompted further interest in collaboration between MOH and SGNED in the use of data to develop messages for improved nutrition education programs. The NCP communications methodology was introduced and apparently made an impact on the approach to health education in Sudan; and finally, the enormous synthesis of existing and new data enabled nutrition educators to focus on the problem as it exists in Sudan, rather than on their own perceptions and guesses.

II. Introduction

This report summarizes the activities undertaken under the Sudan Infant Feeding Project, between October 1, 1988 and December 31, 1989. The project was initiated to study and make recommendations about (1) the potential for marketing of a commercial weaning food; and (2) improvement of feeding practices for infants and young children through the development of a nutrition education/communication strategy for the Nutrition Division of the Ministry of Health (MOH) in three regions of the country (Khartoum, Gezira and Kordofan). The former component of the project was dropped during the early phases of technical assistance, due to the determination that the marketing of a commercial weaning food was not financially feasible under the economic climate existing at the time in Sudan. In addition, due to unforeseen political circumstances, the project was curtailed before the latter component could be completely developed. What follows, therefore, is a description of the process followed in developing the nutrition education component, until its untimely foreclosure.

III. Principal Activities

October - December 1988:

AED staff member Don Levy visited the Sudan to develop an overall strategy and implementation plan for the project, as well as working with the Food Research Centre and the Ministry of Agriculture to develop a technical assistance plan for the commercial weaning food component. The Food Research Centre had devoted considerable time and resources to the development of a sorghum/dry skim milk/peanut mixture for a commercial weaning food - NASHA -- and were ready to explore its commercial viability. Areas identified for NCP assistance included: design, advertising, consumer testing, public relations and marketing.

TABLE A
Sudan Fact Sheet

Total Population	25.2 million
% urban	22%
Female literacy	12%
Per capita GNP	\$374
Women receiving prenatal care	70.4%
Infant mortality rate (/1000 live births)	102
Under 5 mortality rate (/1000 live births)	160
Maternal mortality rate (/100,000 live births 1980-90)	550
Prevalence of undernutrition 12.4% of children under 5 are below <-2 SD weight/height	

Sources:

SERISS, July 1987.
State of the World's Children, 1992, 1994
UNICEF.
African Development Indicators, UNDP and the
World Bank, 1992.
Sudan DHS 1989/1990.

TABLE B
Sudan Project Fact Sheet

Population (in project areas):	5 million (Gezira, Kordofan & Khartoum)
NCP Partners:	School Gardening and Nutrition Education Department, Ministry of Education Sudan Emergency Relief Information Surveillance System, Ministry of Health
Project Duration:	October 1988 - December 1989
Funding: Africa Bureau:	\$150,000
Future Directions:	NCP activities were suspended because the Sudanese government was subject to Section 513 of the Foreign Assistance Act.
Key Products:	Trained 20 Ministry of Health, Education and PVO personnel in ethnographic research skills Infant feeding messages developed in three provinces
Research:	<ul style="list-style-type: none">● Analysis of data on nutritional status and habits from the SERISS study (October 1989)● Coding and Analysis of KAP baseline data from the School Gardening and Nutrition Education Department (April - June 1989)● Rapid ethnographic research on infant and child feeding practices in Gezira, Kordofan & Khartoum provinces (July - August 1989)● Analysis of the Sudan Emergency Relief Information Surveillance System (SERISS) Nutrition KAP and anthropometric data collected in 15,000 households (1986 - 87)

NCP Consultants Gail Harrison and Osman Galal completed a review of child feeding practices in the Sudan from data available in the U.S. A working outline of key issues and questions to be addressed in the formative research was prepared. The main themes are listed below.

Key Formative Research Questions:

- What are the mothers' and other adults' beliefs about infant feeding?
 - Who makes the decisions about what children should be fed, and who acquires the food for households? (Some studies suggest that since husbands do the grocery shopping, they must be included as targets for any nutrition education programs.)
 - Among poor families whose children do relatively well with regard to nutrition, what are the feeding practices?
 - Are there traditional infant/toddler foods which historically were fed to young children but have fallen out of use due to availability or cost?
 - Are there differential child feeding practices by sex, and if so what is their cultural context?
 - How are young children introduced to *nasha*, *assida*, *kisra* and/or bread, and at what age?
 - What are the beliefs and practices about feeding children who are sick, particularly with diarrhea?
-

January - March, 1989:

Dr. Harrison made an assessment visit to Sudan to begin work on the nutrition education/communication component of the project. This consultancy was planned to review recent nutrition/health studies of potential usefulness for planning an infant feeding project; and to identify individuals and groups qualified to carry out a series of focused investigations on this subject.

Dr. Ibrahim Bani, a Hubert Humphrey fellow at Johns Hopkins University, on leave from the Ministry of Health, began working with NCP to develop an evaluation plan for the project.

During this period, the USAID Mission decided to suspend all activities on the commercial weaning food component of the project due to its lack of financial feasibility and perceived low level of consumer acceptability.

April - June, 1989:

Activities during this period centered on preparation and execution of the formative research for the infant feeding component. Research included the analysis of the KAP data from the project sites collected by the School Gardening and Nutrition Education Department (SGNED) of the Ministry of Education; analysis of data on nutritional habits and status which became available from the Sudan Emergency Relief Information Surveillance System (SERISS) study; and conduct of ethnographic research to complement data from these previous studies. SERISS was a large, rapid-turnaround surveillance system conducted in four rounds (1986-87), which sampled children under five years of age from 15,000 households in the six

northern regions.

Dr. Harrison travelled to Sudan to identify and train personnel to conduct sociocultural studies in two pilot areas in the project regions identified by MOH and MOE staff. This research was planned to learn more about family feeding practices, infant and child feeding during illness, prohibitions on feeding during pregnancy, and the feeding of complementary foods after the age of four months. She conducted a small training workshop during which interview schedules and observation guidelines were developed and pretested.

With the assistance of USAID/Khartoum, a local consultant, Penny Nestel, was identified in Sudan to assist with the analysis of the SGNED data. She designed a coding format and ran analyses during Dr. Harrison's visit to Sudan.

NCP contracted with Dr. Sahar Zaghloul, a physician and doctoral student in the University of Arizona Department of Family and Community Medicine, who travelled to Sudan to assist and support the field work, working under the guidance of Dr. Harrison. Her departure was postponed several times due to political changes in the country.

July - September 1989:

In this quarter, NCP supported rapid ethnographic research on infant and child feeding practices which was conducted in six villages in the Sudan, representative of the four pilot project zones in Khartoum, Gezira and Kordofan. This ethnographic research was conducted between July 18 and August 28 by staff of the Nutrition Division of the Ministry of Health and the School Gardens and Nutrition Education Division of the Ministry of Education. Dr. Sahar Zaghloul coordinated the field research during her six-week assignment in the Sudan. (See Annex A for questions explored during the study.)

Dr. Harrison made progress towards finalizing her report of infant feeding practices by compiling the summaries of the Sudan Emergency Relief Information Surveillance System (SERISS) data collected in Sudan under the auspices of other USAID projects, and survey data collected by the School Gardens and Nutrition Education Division (SGNED).

Dr. Ibrahim Bani completed his six-month internship with NCP. During his tenure, he developed an evaluation plan for the project, to determine whether changes in feeding practices could be influenced by nutrition education messages.

In August, NCP was informed that activities in the Sudan would have to be suspended as the Sudanese Government was subject to the imposition of Section 513 of the Foreign Assistance Act. NCP began to set a schedule for the completion of activities, with a project ending date set for December 31, 1989. After discussions with the Office of Nutrition and the Africa Bureau, it was decided to complete the research/assessment phase of the project and develop concrete message guidelines so that the Ministries of Health and Education could continue

independently from that point.

October - December, 1989:

Dr. Harrison completed her report of infant feeding practices, as ascertained from the SERISS and SGNED data, as well as other previously published information she had gathered during her visits to Sudan. In summary, her report states:

"malnutrition is endemic and severely compromises the health of Sudanese children. Protein-energy malnutrition and micronutrient deficiencies (vitamin A, iodine, vitamin C, riboflavin) have been repeatedly documented in various parts of Sudan. The 1984-85 famine and the need to target and evaluate relief efforts resulted in a large cross-sectional survey of nutritional status and related factors in children under three years in the northern two-thirds of the country. This study (SERISS) showed availability of food (both at the local geographic level and in the house hold) as the overwhelming determinant of risk for acute undernutrition in young children. In this data set, Risk of malnutrition was greatest in children aged 15 months to two years. Breast-fed children were better nourished than partially breast-fed or completely weaned children even when the heavily determining age variable was controlled. For children who had been weaned (off the breast), the number of meals per day was directly related to the risk of malnutrition. Consistent with other data sets from the Sudan, girls enjoyed a slight nutritional advantage over boys."

AED staff member Dr. Deborah Helitzer-Allen travelled to Tucson, Arizona to work with Drs. Harrison and Zaghoul on the analysis of the data collected from the ethnographic study conducted during July and August. The small sample size (12 households in each of six villages, or a total of 72 households) made it possible to collect and analyze a broad spectrum of information. This includes information on household demographics, agrarian practices, access to water and sanitation facilities, infant feeding, breastfeeding (both immediately after birth and during the first year of life), weaning, sources of advice, food preparation, access to medical care, incidence of disease, observed nutritional status, 24 hour food recall, and access to communication channels.

IV. Major Research Findings

The important results from the review of previous research conducted by Dr. Harrison were:

- feeding pattern is the best predictor of weight for height, with exclusively breastfed children the best off, nutritionally. Girls were significantly less malnourished than boys, beginning at the age of six months.
- suckling pattern (frequency of feeding) seems to have some effect on this

gender advantage, girls being perceived as more demanding and needing to feed more often, and are weaned off the breast later in the child's life

- abrupt cessation of breastfeeding, due to the onset of another pregnancy, or mother's illness, has a significant impact on nutritional status
- infrequent feeding (suckling) may explain onset of ovulation and thus another pregnancy, and abrupt cessation of breastfeeding, but more research should be conducted on breastfeeding patterns.
- early supplementation (four to six months) may be inappropriate, given the data reported in her report which demonstrate consistent nutritional advantage in infants at any age who are exclusively breastfed.
- withdrawal of food during diarrhea and measles is commonly practiced and should be discouraged.

The data from the ethnographic study, conducted in three diverse regions of the Sudan, show:

- men rarely participate in child-raising tasks. However, they regularly purchase food and take their children to the doctor when necessary. This is primarily due to the restriction on women's movements outside the home in strict Moslem societies.
- more than two-thirds of study families were reported to adhere to basic principles of waste disposal, personal hygiene and food and water storage sanitation.
- two to three meals a day are commonly eaten, with great regional differences in amounts and kind of foods consumed, based on traditional practices and local availability of foods
- strict separation of the sexes exists for meals, with the mother reporting that the best food goes to men and the remainder to the women and children.
- food intake during pregnancy is reported to be restricted by fears of a large newborn and complicated delivery, as well as many traditional beliefs, such as avoiding eggs or hot peppers.
- most women reported visiting a doctor or midwife sometime during their pregnancy, but few reported receiving nutritional advice during their visits.

- the main source of advice for pregnant women were their mothers.
- every mother in the study identified breastmilk as important and essential for children.
- water with sugar and salt is given (most often with cup and spoon) during the first week of life to supplement colostrum, which is given by most mothers.
- the ideal age of cessation of breastfeeding was reported to be older for girls (24 months) than boys (17 months); this was confirmed by data which showed that of the sample of children, for those receiving breastmilk, the mean age of breastfeeding girls was significantly higher, at 11.15 months, than for boys (6.71 months) despite the fact that there was no difference in age distribution between the sexes in the overall sample ($p < .007$).
- cessation of breastfeeding was most often reported to be abrupt.
- the most common causes of early cessation of breastfeeding include: a subsequent pregnancy, maternal illness, and the mother's decision to fast during Ramadan.
- the age at which mothers report that they first supplement breastfed infants differed by region, with the urban infants reportedly receiving supplements earlier than rural infants; in all regions, supplementation before six months is widely practiced.
- the age of first supplementation was reportedly related to the child's ability to sit or the child reaching for food (developmentally about 4-5 months).
- there was no particular "weaning" food, instead normal family foods were given which were thought to be "light," "cold," or "easily digestible" (food lists can be found in the report).
- there were significant differences in types and quantities of food consumption by region, highly dependent on food availability.
- supplementary food is reported to be either withheld or changed during illness, particularly during diarrhea and measles, but breastfeeding continues:
- access to communication channels and listening habits differ significantly by region, Gezira having more radio access and Kordofan having the least, and women in Gezira, consequently listening more than women in other regions; across regions, however, those women who do listen report a preference to music and family programs.

- literacy rates among women were low, and as a consequence newspapers and magazines were not identified as being a source of information.
- there are significant regional differences in reports of access to health information.

V. Recommendations for Future Nutrition Education Activities:

1. Due to regional difference evident from all research discussed above, nutrition education activities should be designed specifically for each region, taking into account local cultural beliefs and practices, access to communication channels, daily patterns of living, and availability of food. Despite these constraints, it is important to note that there are nutrition messages which do not have regional boundaries and can make an impact on nutritional status, despite limited availability of food in households nationwide.
2. In general, innovative approaches to increasing the flow of nutrition information must be conceived, such as through mother's clubs, mobile nutrition "vans," mothers-in-law meetings.
3. Messages may be considered on the following topics:
 - a. **Maintenance and support of traditional breastfeeding practices** (well into the second year of life, and supplemented after the latter part of the first year by household food) should assume first priority.
 - b. **Frequency of feeding, both at the breast and after weaning** within the context of Sudanese child feeding practices, both for the nursing and for the older child. Focus of educational messages on the need for the infant to nurse often, and for the young child to eat several times a day, is appropriate. However, the content of these messages will vary greatly by locale (for example, in Western Sudan where women carry on much of the agricultural labor this message will have quite different behavioral implications than in Eastern and Central Sudan where women are much more limited to the household sphere; in urban areas the situation is still different). Messages focusing on particular foods will likely be less effective than the overall concept that whatever is available should be shared with the child, although some focus on nutritionally dense foods might be appropriate (oil, milk, legumes).
 - c. **Abrupt weaning should be discouraged**, particularly for very young infants. These messages can focus on the reasons for abrupt weaning in given areas and cultural groups. These include childhood diarrhea, measles, or other illness; pregnancy or illness in the mother; and

perceptions of breastmilk having become inappropriate or disagreeing with the infant, depending on the particular local practices and problems.

- d. **Feeding of solid foods during illness should be encouraged; especially during diarrhea and measles.**
 - e. **Food consumption of calories and high protein foods during pregnancy should be encouraged, based on local food availability.**
4. Messages directed at fathers, who are responsible for purchasing food and taking their children to the doctor, should be considered as an important strategy in all regional nutrition education efforts.
 5. Further research: The first phase of research, as described above, elucidated general areas where nutrition education messages may be directed. However, this should be followed by a phase of focused household-based research and trials, and the identification of foods which are both available and acceptable for feeding during illness, particularly diarrhea and measles.

VI. Main Outcomes of the Sudan Infant Feeding Project

Despite the early conclusion of the project, several important outcomes were attained. They include: the training of twenty people in ethnographic research skills; the initial activities have prompted further interest in collaboration between MOH and SGNED; the NCP communications methodology was introduced and apparently made an impact on the approach to health education in Sudan; and finally, the enormous synthesis of existing and new data enabled nutrition educators to focus on the problem as it exists in Sudan, rather than on their own perceptions and guesses.

ANNEX A
QUESTIONS USED TO CONSTRUCT THE ETHNOGRAPHIC RESEARCH
QUESTIONNAIRES IN ARABIC:

At the community level:

- The population at that particular site, how many?
- Language
- Ethnicity
- Social organization: formal or informal leadership of community
- Extended family, polygamous, nuclear
- Religion
- What kind of health services in the village? who is serving and who attends? What kind of medication?
- Agriculture: cash crops, industry wages
- What kinds of food are available in the market, in shops and peddlers by season?
 - Who are the sellers, the buyers? Is there any difference before or after harvest, during Ramadan, during Eid ?
 - Is there any difference in the availability of food between this year and two years ago ?
- Livelihood
 - Occupation, crops, housing, water supply and sewage.
 - Animals at the house, what kind of animal? Where do they keep them?
 - How women spend their time? Where? With whom?
- What is the source of credit or relief during catastrophic illness?

At the household level:

Sociodemographic data:

- Household (HH) composition, type of family, name, age, sex, education, occupation, especially caretaker data, work substitution pattern among women
- Child birth order
- What kind of house (building, the floor, water supply, sewage, electricity, presence or absence of house equipment, refrigerator, TV, radio, stove carpet, reception room)?
- Debt, why, in which season, from whom?

Sanitation Data:

- Type of latrine and its care
 - Where is the cooking place? Is it outside or inside the house? Is it shared with others? What are the cooking facilities ? What are the cooking and food preparation utensils? Do they have special utensils for children? What are the facilities for cleaning utensils? Who does the cleaning?
 - Use of boiled water, everyday or during illness
 - Care of cooking: who is cooking, frequency of cooking, leftover food, place of storage
 - If the child is bottle-fed is there any indication it is washed? Is it shared with other siblings?
 - How do they handle fetus feces? Is it distinct from children or adult?
 - Cultured weaning foods, cultured and social accessibility of different foods to children?
 - Exposure of cooking and eating utensils to insects and dirt during storage
 - Care of cooking and eating utensils
-

- Presence of pests in the house?
- Observing their cloth: what is worn? clean or dirty? light cloth or veil over the infant for protection from dirt or insects?
- Who takes care of the child at home? How long does he/she spend with the child? (+interview)
- holding or caring
- Time the mother consume with her child when sick
- Illness for health care seeking? (interview)
- What is the tradition and cultural beliefs during pregnancy and breastfeeding? (interview)

Food intake data

- What is the type of child feeding (breastfeeding/weaned)?
- Forced feeding?
- How many meals? when?
- Who prepares it? and feeds the child?
- How and where to prepare?
- Sanitary behavior during food preparation (hand washing, vegetable washing, storage).
- What is the order of serving people? Who eats with the child?
- Are they eating on tables, ground, mat..?

Breastfeeding:

- If the child is breastfeed, how many times/day? maternal behavior and feeling during nursing? does the mother feed her child before or after the meal? Does she feed the during night? How many times? Does she feed him/her on demand or following a schedule? Is there any difference in the time of feeding between villages? how long is breastmilk enough a) for mother b) for child? till what age?
- Is there any difference between child's feeding and his older brother? or his sister? when is milk bad/thin/appropriate? How does the mother know? What can be done? What are the consequences to baby/ to mother?

If the child is weaned add:

- What kind of food? What is the common dish? Do they feed the child by hand? Do they eat in one pot? is it specially prepared for him?
- What does the meal consist of? Is there any difference between noon and night?
- What is the proportion of each dish? How much is the child fed?
- Is he urged to eat more? What is the atmosphere during the meal (friendly or conversational or leisure, hurried)?
- When does the mother wean her child? When sick, walking, teething?
- Was he weaned at the same age as his older siblings? If not why?
- Who decides when the child is weaned and why? What is the influence of gender? What is the difference between weak/small/special children? What are the varieties of weaning food? Why?
- During the child illness (diarrhea, measles, skin disease, respiratory illness) is there any change in child's appetite, feeding practice, feeding behavior, type of food (light/heavy, hot/cold) or special food? Why? (restricted vs. prescribed which impact diet most?)
- Does the child seem to have appetite for the food or cries?
- Does the child prefer fluid or solid food? Why?
- What food to be prohibited and what is the food to be encouraged during illness and why? how long after illness do they continue restriction? Time since last meal?
- How does the mother know that the child is cured/doing well?
- Cultural notion of convalescence?
- What is the maternal perception of child nutritional status? Does he/she look like his brother/sister at the same age? Is it a danger to a child to become thin? What can be done to help the child? Does the mother continue breastfeeding when she is sick? What should be done?

ANNEX B
LIST OF NCP REPORTS

Bani, Ibrahim. *Sudan Nutrition Communication Project Evaluation Strategy - The Nutritional Study*. Washington, DC: Academy for Educational Development, May 1989.

Harrison, Gail G. *Nutrition and Child Feeding Patterns in the Sudan*. Washington, DC: Academy for Educational Development, October 1989.

Harrison, Gail G. *Trip Report: Sudan Nutrition Communication Project June 9 - 18, 1989*. Washington, D.C. Academy for Educational Development.

Harrison, Gail G. *Sudan Weaning Food Project - Project Planning Visit: January 8 - 20, 1989*. Washington, D.C. Academy for Educational Development.

Helitzer-Allen, Deborah. *Final Report - Sudan Infant Feeding Project: October, 1988 - December, 1989*. Washington, D.C. Academy for Educational Development.

Helitzer-Allen, Deborah. *Memorandum: Sudan Infant Feeding Project*. Washington, D.C. Academy for Educational Development, 1989.

Levy, Tennyson. *Trip Report: Weaning Food Project, November 28 - December 8, 1988*. Washington, D.C. Academy for Educational Development.

Zaghloul, Sahar. *Trip Report: Rapid Ethnographic Assessment of Infant Feeding Practices in Sudan, July 18 - August 28, 1989*. Washington, D.C. Academy for Educational Development.

Zaghloul, Sahar. *Rapid Ethnographic Assessment of Infant Feeding Practices in the Sudan*. Washington, D.C. Academy for Educational Development, July - August, 1989.

Zaghloul, Sahar. *Draft Protocol for Assessment of Children's Nutritional Feeding Patterns*. Washington, DC: Academy for Educational Development, June 1989.