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Save the Children

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6th December 2002

Dear Sir or Madam,

Final Project Report
Emergency Therapeutic Feeding Assistance - Drought Affected Children in North Darfur
State – Republic of Sudan

HDA-G-00-01-00101-00 (SC UK ref – USAID/1817/3426)

Please find enclosed the final narrative and financial report for the award mentioned above, covering the period from 1st July 2001 to 31st December 2001. Please also find enclosed an evaluation of this project. Copies of this report have been distributed as listed below.

Organisation	Recipient	Narrative Report	Financial Report	SF 269a and SF270
USAID Washington	Bart Deemer	1	1	1
	Georgia Beans	1	1	1
	OFM		3	Orig. + 2
	Dev. Exp. Clearinghouse	1		
SC UK Sudan	Robert Ffolkes	1	1	1
	Abdul H. M. Rhametella	1	1	1

Please do not hesitate to contact me should you require any further information.

Yours sincerely,

Jack Matthews
Assistant Programme Funding Officer

tel. no: +44 (0)20 7703 5400
email: j.mathews@scfuk.org.uk

Copied to:

SC UK - London	Jenny Hopps
SC UK - London	File

Save the Children - UK

FINAL REPORT TO OYDA

*Emergency Feeding Project
North Darfur State,*

Republic of the Sudan

March 2002

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I. EXECUTIVE SUMMARY:

Organisation: Save the Children United Kingdom

Date: March 2002

Mailing Address: Mary Datchelor House
17 Grove Lane
London SE5 8RD
United Kingdom

Contact Person: Jenny Hopps,
Programme Officer East and
Central Africa

Telephone: 0044 207 716 2223

Fax: 0044 207 793 761017

Internet Address: J.Hopps@scfuk.org.uk

Programme Title: Emergency therapeutic Feeding Assistance to Drought
Affected Children in North Darfur State, Sudan

Cooperative Agreement/Grant Number: HAD-G-00-01-00101-00

Country/Region: North Darfur State,
Republic of the Sudan

Disaster/hazard: Drought

Period of activity: Originally planned for four months July 3rd until 3rd
November 2001.
Extended to 31st December 2001.

Budget allocated by OFDA: \$ 500,047

Background:

The poor rains in year 2000 led to harvest failure, poor pasture and acute water shortage in most parts of North Darfur State. This threatened lives and affected livelihoods of the population in the State.

MoA using balance sheet approach estimated the over all deficit in grain production was 122,563 MT. A total of 26,000 MT was estimated by SCUK using Household Economy Analysis (HEA) to be distributed as free food to the poor people in pastoral, goz, tombac, wadi and non wadi, and Jebel food economy zones. The distribution should have started on March 2001 to avoid deterioration of nutritional status of the children under five that was predicted by EWS of SCUK. As well the market mechanism had to work to supply grain in the markets and stabilize the grain prices to enable the middle and poor groups to access grain at affordable prices.

The failure of production led to sharp increase in grain prices and decrease in grain supply to the market. This coupled with stagnation of livestock trade and shortage of water weakened the capacity of poor people to feed their families.

In April 2001 EWS of SC UK conducted a nutritional survey covering five Food Economy Zones of Pastoral, Goz, Non Wadi, Tombac and Jebel. The result indicated serious nutritional status of the less than five years with global rate of 23.4% <-2Zscore and 3.3% <-3Zscore. The result was in line with all the other indicators of food economy. Accordingly the recommendation was made of the need for general food distribution, Blanket Supplementary Feeding Programme, health and water intervention.

As the result of the survey and the recommendation SCUK applied for blanket SFP for 10 affected Local Councils, however it was difficult to secure funds for this. SCUK applied for funding for a targeted supplementary Feeding project to OFDA and DFID for malnourished children less than five years, pregnant and lactating women in 10 affected local councils, namely El Fasher, Tawilla, Korma, Mallit, Sayah, El Malha, Rohal, Teina, Um Barrow and Karnoey.

II. PROGRAMME OVERVIEW

A - The Goal of the programme as stated in the proposal:

“To improve the nutritional & health status of all malnourished under-five children, all pregnant & lactating women who are residing in 4 of the drought affected rural councils of North Darfur and thereby reduce the associated excess mortality amongst children aged below five years of age to less than 2/10000/day.

The project Objectives were:

- Dry take home selective supplementary feeding provided to all malnourished children residing in 4 of the most severely drought affected rural councils of North Darfur.
- Dry take home supplementary food provided to all pregnant and lactating mothers residing in the 4 target rural councils.
- Dry therapeutic food (plumpy nut) provided to all severely malnourished children at weekly intervals with health check and growth monitoring.
- All malnourished children get access to basic outpatient medical care and those severely malnourished children too sick to be managed at home get referral services (transportation) for admission to the nearest paediatric hospitals.

B - Profile of target population:

The drought-affected population living in the four rural councils targeted under the USAID grant was 138,083.

The break down of the beneficiaries by category was as follows:

- Moderately malnourished (70-80% WFH) under-fives **6831**, (estimated at 30% malnutrition prevalence rate)
- Severely malnourished (<70% WFH or bilateral oedema) under fives **211**, (estimated at 3% malnutrition prevalence rate)
- Pregnant women **3313** (estimated as constituting 2.4% of the general population)
- Lactating mothers **3590**, (estimated as constituting 2.6% of the general population)

C - Geographic location of the project:

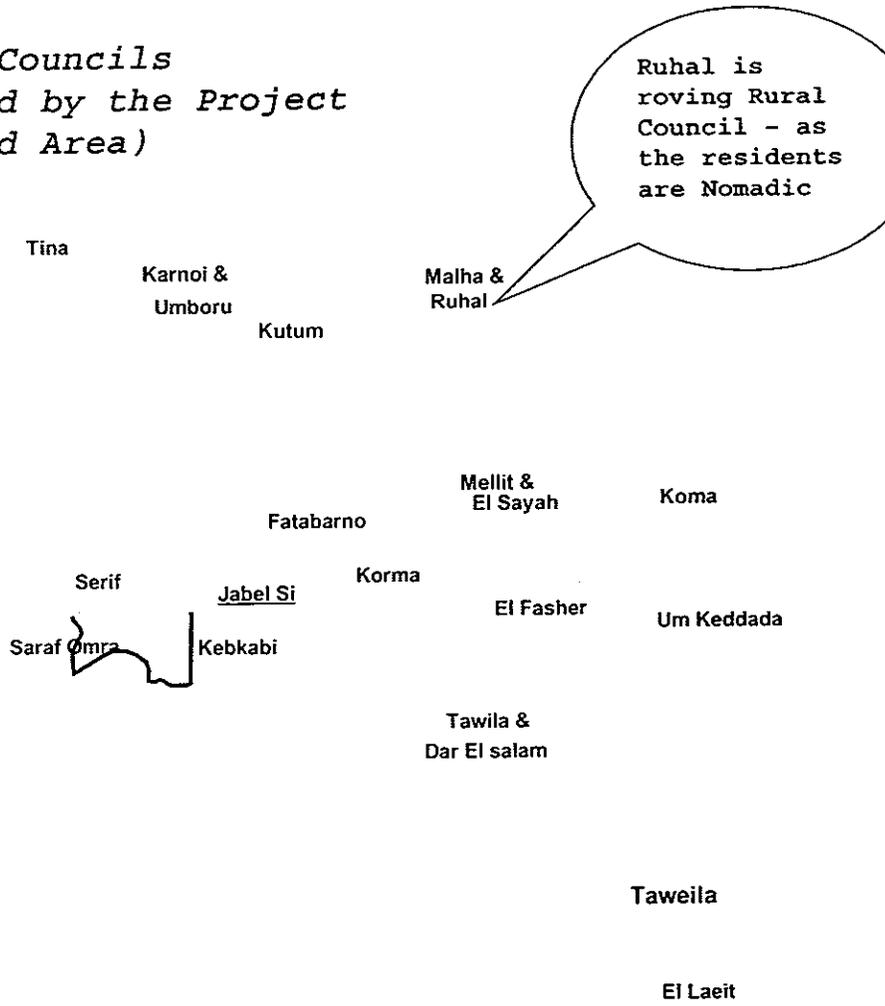
The Four Rural Councils and the targeted beneficiary numbers under this project are in table (1) and map (1) below:

Table (1):

Rural Councils	Drought affected Population	<5 Yrs At 17% of population	WFH 70- 80% At 30%	WFH <70% At 3%	Pregnant & Lactating Women	Total beneficiary
Tina	21596	3671	1101	33	1080	2181
Ruhal	15353	2610	783	23	768	1551
Um Buru	57984	9857	2957	89	2899	5856
Karnoy	43150	7336	2201	66	2158	4358
Total	138083	23474	7042	211	6904	13946

North Darfur
State

Rural Councils
Covered by the Project
(Shaded Area)



The project start date was delayed due to the time required to get the required supplies from Kenya. The delayed start of the project coincided with the time when most families were busy with farming and the start of the rainy season. A significant number of malnourished children were enrolled late. In order to ensure that these children were discharged when recovered the project was extended till the end of December 2001.

Due to the delay in procurement and lack of the required quantity of supplementary food in country the priority was given to malnourished children who received their full ration since the start of the project. The pregnant and lactating women were excluded in the first two months until the full supply of UNIMIX received on site in El Fasher. At the end of October these category (Pregnant & lactating women) had been screened, identified and they received their ration effectively November and continued till the end of December 01.

III. PROGRAMME PERFORMANCE:

- As a result of the project and the limited free distribution of basic ration mass population movement was been averted. The mortality rate associated with malnutrition was reduced to below 2/10000/day. (This was confirmed by the nutrition survey conducted in Feb./ March) The project was ending in 31st of December the impact was evaluated in February/March through the nutrition survey covering four food economy zones namely Pastoral (Malha), Goz (Mellit & Sayah LCs), Tombac (Tawilla & Korma LCs) and Non Wadi (Kutum & Fata Barno LCs). The first three food economy zones were covered by SC (UK) and the fourth one was covered by GOAL Ireland.
- The mortality rate recorded amongst the registered malnourished children is < 8%, which is within the acceptable SPHERE standard. Every child enrolled in the feeding project had at least one medical check if moderately malnourished and weekly for those severely malnourished. Other children (not malnourished) also benefited from improved health services as a result of the increased availability of drugs at the health units provided by this project and other complimentary emergency health projects (measles mass vaccination funded by OFDA and Government of Netherlands (GONTH), support to health facilities and training funded by (GONTH), SFP funded by DfID, water intervention funded by(SCUK, DFID and ECHO))
- Though there was a delay in the international procurement 1.6 mt of high energy food (plumynut) and 334.7 mt of UNIMIX, these were purchased and transported to the project sites, and distributed to the target malnourished children, pregnant and lactating women. The coverage rate¹ of the project is calculated at 86.6% using the target figure calculated on official population figures table (. The coverage rate was low at the beginning of the programme with 56%. This is mainly due to population

¹ See annex II for details on numbers of children by rural council and by category. There were delays in the supply of UNIMIX from our supplier in Nairobi, which affected the rate of implementation of the project and as such pregnant and lactating women were not included in the project till end of October.

migration as the residents of the targeted rural councils are traditionally nomadic. However the coverage rate was increased through different measures taken by the team (creation of sub centers, using of community nutrition workers (CNWs) to identify malnourished children in each village and then recheck by the team, hygiene promotion and distribution of soap to mothers.). By the end of the programme we confirmed that 90% of all malnourished children present in the rural council were enrolled.

- SCUK recruited the following project field staff.
 - 1 nutrition Coordinator
 - 1 medical Doctor,
 - 2 nutrition Supervisors
 - 4 team leaders,
 - 4 medical assistants,
 - 8 nurses/monitors,
 - 1 data processor,
 - 1 logistics officer
 - 1 storekeeper

from which 4 teams each composed of 4 members (**Team composition:** Team leader, two nurses/monitors and medical assistant). Every team had about 50 CNWs working within the nutrition team but they were based in the scattered villages. Each team was allocated to one LC.. The four medical assistance and the eight nurses were seconded from MoH to shoulder the technical issues. These staff received training in nutrition aspects, anthropometrics measurement, refresher training in treatment of malnourished children, management of UNIMIX, hygiene promotion.

- The community nutrition workers were selected by the community two per each village council and were provided training on basic nutrition. The CNWs played a key role in the project through information dissemination, defaulter tracing and providing health education to mothers. The local radio, mosques, mobile team and

- All severely malnourished were seen and weight and height were taken on a weekly basis and had red bracelets put on their wrists to facilitate identification, and defaulter tracing.
- The delay in the supply of the UNIMIX necessitated the postponement of the inclusion of the pregnant and lactating category to the programme. They were registered and included in November and December (the ration is double).
- All children enrolled in the therapeutic category regularly received 4 Kg of unimix and plumpy nut on a weekly basis. Each malnourished child had health screening at the time of screening and got prompt treatment when found to be ill.
- All the children had received vitamin A supplements at the time of screening and all those children that were missed out during the measles vaccination were vaccinated. Mothers of malnourished children were trained on the use of ORS, use of the supplementary food and were also supported on the management of diarrhoea at home through the community nutrition workers who visited them at home.
- In order to ensure access for home visits the community nutrition workers were elected by the community. The priority was given to women able to read and write. The community nutrition workers were trained on the use of ORS and the use of therapeutic food and they in turn provided training to mothers on uses of UNIMIX, hygiene promotion and awareness to decrease defaulters during their individual home visits.

Severely malnourished children received home visit regularly and as a result of this the defaulter rate was below 8%.

- SC (UK) in collaboration with GOAL IRLAND provided training to MOH hospital staff with initial supplies of F75/100 to the hospital paediatric wards but after September GOAL started work in supporting the MOH hospitals.
- All children that were too ill to be managed at home were referred by the project to the nearest paediatric ward and to MOH dispensaries that were supported by SC (UK) depending on distance. The death rate recorded is below 5%.

- Out patient OTP dispensaries were established mainly for the severely malnourished with no appetite. Children received a 24HRs standby care from medical assistants and nurses. The therapeutic treatment given to them was F75 in phase one and F100 in phase two through NJ tube. 22 severely malnourished children were admitted in the dispensaries instead of referred to the hospital. All of these children were admitted in late stage and with dehydration.

The experience show that working in the dispensaries of LCs saved the live of severely malnourished children which they expected to die during the referral to the hospital. The close dispensaries are preferred by the caretaker of the children because they stay very close to the families and can check the remaining children at home.

The transfer rate from severe to moderate was around 80% and readmission to the severe category was less than 5%.

There was good interagency coordination and the project was implemented in coordination with the state MOH, the community and GOAL (GOAL had started supporting the hospital therapeutic feeding wards as of September)

- Ms. Yvonne Grellety, external consultant evaluated the effectiveness of the management of the severely malnutrition in December. Mark Myatt, external consultant designed the anthropometrics, survey and mortality questionnaire to evaluate the S&TFP through an impact nutrition survey in February. The nutrition survey was conducted in February/March and the findings of the two reports and lessons learnt are available for sharing.

Lessons Learnt and recommendations

- CNWs are SC (UK)'s created nutritional human back up that can be early warning, activated at any time where such a need arose. Also they are valuable for any other interventions of food security. CNWs are example of community participation and feeling of their ownership to support given to them and they remain a link between SCUK, INGOs and the community of the North Darfur State.

- Influence of traditional leaders is of valuable outcome in mobilizing communities
- Documentation/registration of total <5s screened is useful for evaluation of coverage.
- Provision of food/meals for caretakers of the children admitted in the dispensary is determinant factor in families taking children to health facilities.
- Verification of the Distribution Centres should be done earlier and at the village council level.

IV. RESOURCE USE/EXPENDITURES

A- Brief summary of resources committed

The total cost of the project was \$500,047 (see budget breakdown) Expenditures were incurred on the following

Staff salaries.

Administrative Costs.

Transport

Supplies and Equipment

B- Table budget breakdown and expenditure:²

² See annex I for detailed financial statement

ANNEX II

Analysis of moderately malnourished children

LC	Discharges	Defaulters	<85%WFH	<80%WFH	Referred to OTP	Re-admissions	Total
Rohal	480	15	281	132	2	0	776
Ombarow	813	118	462	136	2	0	1393
Karnoey	1108	135	367	73	8	0	1610
Teina	607	120	143	44	1	0	870
Total	3008	388	1253	385	13	0	4649

ANNEX IV

Analysis of Severely malnourished children:

LC	Total Cover	Refer To SFP	Refer to hos. /dis	Defaulters	Readmission	Remained	Deaths
Rohal	12	10	0	1	0	1	0
Ombarow	12	6	3	0	0	1	2
Karnoey	40	35	3	0	0	0	2
Teina	26	21	0	3	0	0	2
Total	90	66	6	4	0	2	6

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Evaluation of the outpatient therapeutic care programme, Save the Children UK, North Darfur, Sudan, 2001

Summary of key findings

Acknowledgements:

Many people contributed their expertise and commitment to this project and its evaluation and they deserve our thanks. The consultants who have been involved in the project cycle are: Steve Collins (surveys and project design), Yvonne Grellety (evaluation) and Mark Myatt (surveys and evaluation). This report draws on project documents, survey reports and the consultants' reports.

Context of the programme

North Darfur experienced a severe drought in 1999 and 2000. This caused widespread crop failure, disruption to markets, decrease in the earning power of all families and a generalised decline in food security.

In October 2000, the annual assessment of food needs undertaken by SC-UK and the Development & Rehabilitation Committee (DRC) of north Darfur, concluded that during 2001 between 17,192 and 26,057 MT of relief grain would be required, in order to prevent loss of life and destitution. The report recommended that this food be distributed from March 2001, to preempt the start of an extended hunger gap and to ensure that food was available before the planting season in July.

Despite efforts repeated efforts by SC UK from October 2000 onwards to advocate for a response, it was not possible to mobilise donor support for food distribution. It had been hoped that a general ration would be distributed to prevent a further deterioration of the food security situation.

Nutrition surveys carried out in April revealed the following rates of malnutrition and it became clear that supplementary and therapeutic feeding would be needed to prevent further loss of life in the population under 5¹.

- Global (< -2 z-scores or oedema) = 23.4% (95%CI 21.8 – 25.0)
- Severe (< -3 z-scores or oedema) = 2.1% (95% CI 1.6 – 2.6)

On the basis of the survey results, blanket supplementary feeding was proposed for all 21 rural councils. Again it was not possible to secure donor support for this. A proposal was made for targeted supplementary feeding in the six worst effected rural councils and funding was secured from DfID. USAID subsequently indicated that it could make US\$500,000 available so it was possible to include a further 4 rural councils in the programme. The rural councils were selected on the basis of the severity of their situation according to the nutrition survey results (calculated by food economy zone) and the Food Economy reports². A general ration distribution of 15,000MT of grain was also made between May and October.

¹ For full results see Collins, S., 2001, The dangers of rapid assessment. Field Exchange Issue 13. ENN

² Particular attention was paid to prioritising the prevention of distress migration.

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Once funding was secured, SC UK implemented an outpatient therapeutic feeding programme (OTP) with a ready to use therapeutic food (RUTF³) which enrolled and treated 836 severely malnourished children and a targeted⁴ supplementary feeding programme enrolling approximately 24,000 children and 23,000 pregnant and lactating women in 10 rural councils of North Darfur during the period August 11-December 12 2001.

Other emergency interventions included: DfID and ECHO funded SC-UK to drill/rehabilitate 151 shallow wells or hand-pumps. The government of the Netherlands funded the provision of free basic drugs to dispensaries and clinics in 4 of the 22 rural councils. USAID funded a measles vaccination campaign.

Outpatient Therapeutic Programme design and content

Children were screened in the first instance using MUAC and by checking for nutritional oedema. Children 12-59 months with a MUAC <115mm and children 6-11 months with a MUAC < 110mm were measured immediately using weight for height. Children aged 6-11 months with MUAC 110-115mm and children aged 12-59 months with MUAC 115-119mm immediately received supplementary food and were measured using weight for height one week later⁵.

Children <70% weight for height or with nutritional oedema were immediately seen by the medical team comprising a medical assistant and team nurse. Children with oedema, severe dehydration, no appetite and visibly not eating RUTF when offered, temperature >39 degrees, increased respiratory rate (> 35 if over 2 years, > 40 if 1 - 2 years or > 50 if less than 1 year) or any sign of illness were referred in the first instance to a hospital (four hospitals were being supported by GOAL to give therapeutic care). Where a child could not be taken to the hospital due to the distance, they were referred to a stabilisation centre (3 of these were set up in health centres located in areas least accessible to the hospitals).

Treatment in the stabilisation centre included: rehydration⁶ where necessary, treatment with a systematic antibiotic (amoxicyclin) and fansidar, folic acid, vitamin A, measles vaccination, feeding with F75 by naso-gastric tube and daily examination and monitoring.

Children were discharged from the stabilisation centre to the OTP when appetite was shown to have returned by the successful eating of RUTF for more than one day. Children were referred to the hospital if they vomited more than 50% of the feed after 6 consecutive meals, had a body temperature >39C or had a high respiratory rate or failed to regain appetite after 5 days in the stabilisation centre.

³ Nutriset Plumpy Nut was used.

⁴ Children were admitted according to MUAC criteria and not discharged from the programme. This allowed a greater number of children to benefit from the programme than would have been possible with standard weight for height entry and exit criteria. This was desirable given the limited available support to households.

⁵ MUAC cut offs were calculated using sensitivity and specificity analysis of weight for height and MUAC data on a sample of 733 children at the first distribution's screening session

⁶ Water, ORS and sugar were used (using the recommended recipe) for rehydration as CMV or Resomal were not available to the programme.

Children admitted into the OTP received a systematic antibiotic (amoxycillin), chloroquine (according to the Ministry of Health treatment guidelines), folic acid, vitamin A, measles vaccination and 14 packets of 0.92g and 500 kcal RUTF per week. Children in the OTP were visited daily by the Community Nutrition Worker (CNW) who checked the child for appetite (sachets of RUTF eaten the previous day), diarrhoea history, thirst, dehydration and the presence of a carer and watched the child consume RUTF. Children had a full examination weekly by the team nurse or medical assistant (health professional category just below a doctor in Sudan) and their weight for height was recalculated.

The CNW was also responsible for the identification of severely malnourished infants through community screening, instruction in the use of therapeutic foods through home visits, the identification (alongside the medical assistant and nurse) and referral to inpatient units of severely undernourished children who failed to thrive in the outpatient program due to anorexia or co-morbidity, hygiene promotion activities and the distribution of soap to mothers of severely undernourished children with skin diseases, the promotion of the use of ORS through home visits and to act as a 'contact point' between the community and other elements (e.g. the clinical team) of the outpatient therapeutic program.

Children were discharged from the OTP to the supplementary feeding programme when they had reached 75% weight for height for 4 consecutive weeks.

In total the programme had 100 distribution points and employed 290 field staff including medical assistants and nurses, CNWs, and Team leaders.

A note about data quality

A comprehensive monitoring system was put in place to monitor the programme outcomes as it was a new type of intervention for SCUK. The data system was specially designed for the programme but proved to be inadequate and would have to be substantially revised for any future programme. One of the reasons may have been that the programme had to start quickly because the rains were forecast which had the potential to severely hamper distributions. Specific problems encountered were inconsistencies between daily and weekly reporting forms, some children's outcomes not reported at the end of the programme due to the rush to close and the failure of the system to track children through OTP and SFP.

Outpatient Therapeutic Programme outcomes

Table 1. Key outcome indicators for quality of care for the 3 months of operations in the OTP

	Average percentage	range
Discharged to supplementary feeding programme	81.4	(48-100)
Defaulted	10.1	(0-36)
Died	2.9	(0-7.7)
Transferred (to TFC, hospital or dispensary)	5.6	(0-15.4)

Mortality:

A mortality rate of 2.9% is very low and well within Sphere standards. However, the mortality rate is difficult to interpret because children were discharged to supplementary feeding after reaching 75% weight for height and some of these children may have subsequently died. Using the Prudhon index the *expected* mortality was calculated based on i) the death rates achieved in conventional but well run TFCs using internationally recognised protocols, ii) the anthropometric / oedema profile of children admitted into the OTP, iii) the deaths which can be expected in the period from admission to discharge at 75% weight for height, and iv) using a correction factor to take in account the transfer of children (potentially the most sick) to other facilities⁷. The expected number of deaths was compared to the observed deaths in the OTP. Half (51%) of expected deaths of children without oedema (n=744) were actually observed while almost all (92%) those expected occurred for children with oedema (n=62). Rates did vary according to location (see ranges in Table 1).

Other indicators:

The average rate of *defaulting* was skewed by the high rate of defaulting in one location where the largest number of children were admitted (El Fasher town) and where up to 34% of children defaulted. This was mainly because the children were from pastoralist families who only stayed in the town for a few days at a time. 36% of children defaulted from another location (Tina) in the pastoral area where only 24 children were admitted. Discharge rates were therefore also low in these two centres. With the exception of these two locations, defaulting rates in the other 9 locations remained below 14%. *Readmission* rates were approximately 1.0% of total admissions.

Mean length of stay was estimated at 25 days for wasted children and 35 days for oedematous children. This data, once again has to be interpreted in the light of the discharge criteria of 75% weight for height compared to the usual 85% weight for height.

Mean weight gain was 6.6g/kg/day for wasted children and 1.8g/kg/day for oedematous children.

Children in the stabilisation centres:

Only 17 children were admitted to the stabilisation centres, three children in total died though two died after discharge to the OTP and are therefore included in the death rate in table 1.

⁷ If transfer rates are not taken into account, mortality rates can appear very low if all complicated / high risk cases are transferred

Coverage:

Table 2: rough estimates of coverage by OTP location

Rural council	Maximum coverage of OTP (exc TFC) %	95% Confidence interval
Al sayah	56	23-156
El fasher rural	39	21-81
El fasher town	24	12-49
Karnoi	53	21-137
Korma	50	27-104
Malha	25	10-70
Mellit	58	24-162
Rohal	10	4-27
Tauwillla	30	16-62
Tina	20	8-52
Umborro	11	4-28
Total	32	15-71

Table 2 shows the range of estimated coverage rates achieved by rural council. The rates are comparable to rates achieved in well-run TFCs operating in high population densities. More children were admitted in locations where prevalence of malnutrition was higher. Taking into account the children admitted into the hospital the presence of TFCs did not increase coverage substantially (35% (17-79)).

There are two possible reasons for the lower than expected coverage rates. First, part of the programme period overlapped with the planting season which affected the rate of admissions into the programme and second a miscalculation was made in setting the registration targets which may have affected the rate of case finding.

The estimates in Table 2 are problematic for several reasons:

1. It was not possible to estimate coverage with an anthropometric survey during the project period. The numerator is the total number of children admitted (minus readmissions and transfers) over the 3-month project period. Coverage should be estimated at a single point in time and could therefore be as little as a third of the estimated coverage in Table 2.
2. There are the usual problems in accurate estimates of population figures. These figures are based on 20% of the population being under five years, whereas the Bureau of Statistics recommends this figure to be 16.6%. The data for the pastoralist areas could underestimate the real coverage due to overestimation of population in these areas. Both of these factors could mean that the coverage figures are underestimated.
3. The estimates of malnutrition were based on a survey conducted in April 2001 and compared to children admitted into the programme August – December 2001. Malnutrition could have increased in the run up to the harvest in October / November or, as in west Darfur, could have declined.

The wider context of the programme

Table 3: acute malnutrition before and after the intervention

Food Economy Zone	April 2001				January 2002			
	Global malnutrition (WHZ)	acute (CI)	Severe malnutrition (WHZ)	acute (CI)	Global malnutrition (WHZ)	acute (CI)	Severe malnutrition (WHZ)	acute (CI)
Goz	31.3	(27.2-35.5)	3.0	(1.9-4.7)	8.7	(6.5-10.8)	0.3	(0-0.6)
Tombac	20.3	(17.1-23.4)	2.7	(1.5-3.9)	11.8	(9.0-14.7)	3.5	(1.5-5.5)
Pastoralist	26.1	(22.4-29.7)	1.7	(0.7-2.7)	18.5	(14.7-22.3)	2.2	(1.2-3.2)
Non-wadi	18.9	(15.6-22.3)	1.1	(0.7-3.2)	9.9	(7.2-12.5)	0.7	(0-1.3)

Table 4: Under five mortality rates (3 month⁸ retrospective survey using previous birth technique)

Food Economy Zone	Rate per 10,000 per day
Goz	0.92 (0.4-1.44)
Tombac	3.78 (3.07-4.49)
Pastoralist	0.23 (0.02-0.43)
Non-wadi	0.65 (0.25-1.05)

Table 3 shows that rates of global acute malnutrition have declined significantly in all food economy zones since April 2001, though rates of severe malnutrition have only declined significantly in the Goz area. Rates of severe malnutrition remained high in January 2002 in the Tombac area and in contrast to all other areas (and the April survey), 96% of the severe malnutrition was oedematous. The Tombac area was also the only area where severe malnutrition measured by MUAC (<110mm) gave a higher prevalence than severe malnutrition measured by weight for height. The Tombac area is also the area with the highest under-five mortality rate. In all other zones the under-five mortality rates were acceptable. It is interesting to note that the decline in prevalence of global acute malnutrition was least dramatic in the pastoral food economy zone suggesting that people dependent on livestock for the livelihoods are the slowest to recover after a bad year.

Conclusions

It was hoped that outpatient therapeutic care would offer the following programmatic advantages:

- It would avoid having to set up many TFCs which would have been beyond the capacity of any operating agencies because the large area and scattered population would have required the construction, staffing, and equipping of dozens of TFCs in order to achieve acceptable levels of coverage and equity of provision. It would therefore allow a decentralised programme which maximised access, and therefore coverage, to be implemented.
- It would avoid having children concentrated in centres risking cross infection and being subjected to ill trained medical staff
- It would allow the community greater participation in the programme and reduce the cost to families of participation in an inpatient programme
- It may be cheaper than TFCs as the technical staff costs and physical infrastructure costs of centres would be reduced.

⁸ average of 82 days for retrospective mortality survey conducted January 2002

In reality, the programme admitted 836 children which is probably several times more than a therapeutic feeding programme could have achieved within a 5-month period (from funding to closure) in North Darfur. Mortality rates were very low, probably due to a combination of not being presented with the risk of poor care and cross infection in a TFC and because rates of oedema and complicated malnutrition were low. The reduced costs to the community through a decentralised programme have not been evaluated but the overall programme costs (approximately £260 per child) do not vary substantially per beneficiary from costs per child in a TFC. Coverage rates were not as high as hoped though they were of the order achieved in well run TFCs in areas of much higher population density. Defaulting rates were generally very low except in the pastoral areas.

The future replicability of this programme needs to be considered in the light of the fact that in N Darfur Save the Children has

- i) a good knowledge of both the macro-economic and micro-economic (i.e. household food economies) context of the intervention setting
- ii) a good knowledge of the geography of the intervention setting
- iii) ready availability of qualified staff and other resources such as offices and vehicles
- iv) good relations with the intervention population
- v) good relations with local government officials at all levels
- vi) good relations with the government health systems allowing local health staff (i.e. medical assistants and nurses) to be seconded to the program for both service delivery and training of community nutrition workers as well as the use of primary and secondary level health facilities
- vii) strong leadership and good support from SC (UK) national and international offices
- viii) the existence of a strong community ethic in the intervention population and
- ix) the availability of a ready to use therapeutic food (RUTF) acceptable to the intervention population.

These factors undoubtedly contributed to the success of the OTP. However, it should also be pointed out that North Darfur does not provide an easy operating environment and the food security situation was severe. The success of the OTP programme suggests that agencies, with adequate technical support, should make efforts to explore and carefully analyse the options for programming which RUTF presents.

Future recommendations

The results of the evaluation from the programme in North Darfur give grounds for cautious optimism. The programme was implemented with strong technical support in the phases of design and early implementation, was thoroughly and independently evaluated and the results have been disseminated. We consider these to be essential components of any future work using RUTF or aiming to treat children with severe malnutrition outside of the TFC or hospital setting. There are also some priority areas for research and analysis in any future pilots of outpatient care:

1. More experience on the potential complementary functions of traditional TFCs, hospitals, stabilisation centre (as conceived in Darfur) and outpatient care. Appropriate protocols for each level need to be developed and models for systems of referral need to be piloted.
2. How the needs of children <6 months old and <4kg or with oedematous malnutrition can be addressed in a programme with an outpatient component.
3. More careful analysis of the varying weight gains which children achieve on RUTF is required to understand its suitability for different conditions.
4. The long term prognosis for children receiving outpatient care compared to those who are discharged from a TFC should be evaluated.
5. The extent of the reduced cost to communities of a decentralised outpatient programme compared to an inpatient programme should be examined.
6. Whether there is greater opportunity for improved psychosocial stimulation during therapy through an outpatient programme than an inpatient programme should be reviewed.
7. The degree of compliance with systematic antibiotic / micronutrient regimens that can be sustained in an outpatient programme should be examined
8. Priority should be given to the use of other suitable RUTFs such as BP100 and to the development of more scientifically evaluated products with a view to reducing prices. Currently the price of Nutriset Plumpy Nut is prohibitive for routine use.
9. Adequate monitoring systems based on those used for inpatient care should be established.

For more information please contact Anna Taylor, Nutrition Adviser, Save the Children UK.

A.Taylor@scfuk.org.uk

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