**Research Proposal**

Department: Nutrition

SCI states:  North Darfur, Central Darfur, South Kordofan (plus locked areas of Nuba Mountain) and North Kordofan States, in Sudan.

Time Frame:  June 2024 – July 2025

**BACKGROUND**

Since the outbreak of civil war in April 2023, Sudan has faced an escalating humanitarian crisis marked by a significant rise in acute malnutrition, especially among children under five. This crisis has been exacerbated by ongoing conflict, resulting in widespread displacement, disrupted access to essential services, and worsening economic insecurity, which make it increasingly difficult for families to obtain nutritious food and necessary healthcare. The latest global acute malnutrition rate surpassed 30% in North Darfur in three localities, highlighting the serious continuous deterioration in the nutrition situation.

Through funding from OCHA/SHF, Save the Children (Save) is currently implementing a program called Assida Plus (Assida +) in Sudan’s North Darfur, Central Darfur, North Kordofan and South Kordofan regions (including Locked Areas). The program focuses on famine prevention through a combination of integrated nutrition and food security interventions. These regions are among the most severely affected in the country and without consistent community-based management of acute malnutrition (CMAM) programming.

Assida + is comprised of two key interventions:

1. **Blanket Supplementary Feeding Plus (BSFP+):**

This component includes all activities under the SBC+ intervention (as outlined below) and adds a monthly supplemental food ration distribution.

1. **Social Behavior Change Plus (SBC+):**

The SBC+ intervention integrates a range of activities aimed at improving nutrition, health, and hygiene behaviors:

* Conduction Mass MUAC and Oedema screening and referral;
* Screening and referral for pediatric and SRH danger signs;
* Vitamin A and Deworming preventive dose catch up;
* Screening and referral to catch up vaccinations;
* Referral for ANC/PNC services for eligible women/infants;
* Referral to Growth Monitoring Program if not yet enrolled;
* SBCC on Health, WASH and Nutrition (IYCF);
* Family MUAC training and provision of MUAC tape;
* Promotion of fuel-efficient stoves to save money and prevent GBV;
* Promotion of Tippy Tap home-made handwashing station to improve hygiene.

The primary goal of Assida + is to prevent malnutrition and, in instances where there are no functioning Targeted Supplementary Feeding Programs (TSFP) services, prevent further deterioration in nutritional status. The program aims to target 15,618 children under five and 2,755 pregnant and breastfeeding women and girls (PBWG) in BSFP+ and 42,400 children under five in SBC+ as follow:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ***BSFP+*** | **SK** | **NK** | **ND** | **CD** | **LA** | **Total** |
| **U5** | 1856 | 3798 | 3000 | 4442 | 2522 | **15618** |
| **PBWG** | 327 | 670 | 529 | 784 | 445 | **2755** |
| **Total** | **2183** | **4468** | **3529** | **5226** | **2967** | **18373** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ***SBC+*** | **SK** | **NK** | **ND** | **CD** | **LA** | **Total** |
| **U5** | 4800 | 5600 | 4800 | 8000 | 19200 | **42400** |

***Note****: these are initial estimations, the reality might have been different. Not all above children received the 4-5 months supplementation, however we can estimate 70% of them did.*

The program is funded for a total of six months, of which considering the first month of planning and setting up the program, five remaining months have been considered for the program implementation. However, challenges during the startup phase resulted in delays, leading to a staggered rollout across the regions. Program implementation began in some areas in August 2024 (NK), while others started in September 2024 (CD and SK) and in October 2024 (ND and LA). Despite delays, implementation is expected to conclude in December 2024 for CD, in January 2025 for SK, in February 2025 for NK and in March 2025 for LA and ND (with all areas receiving four to five months of programming.

Within the BSFP+ program, each month (calculated as 4 weeks = 28 days), caregivers will receive a food ration designed to supplement their child’s diet, containing ingredients which are intended to be prepared as a porridge for the child, as per below:

* 3 kg of Sorghum
* 750 gr of unshelled groundnuts
* 750 gr of sugar
* 700 ml of oil (preferably fortified)
* 30 gr of iodized salt

The nutritional value of the ration, calculated in NutVal 4.1 Version, and here below the micro and macronutrient contents of the daily ration (the above divided by 28 days):



Monthly distributions will be done during the follow up session which include a participative cooking demonstration to guide caregivers on how to properly prepare and store the porridge, in addition to nutrition messages on how to enrich the recipe with other nutritious foods. PBWG participants will receive the same food basket to support their dietary supplementation.

SCI is aiming to use the program as an opportunity to conduct a secondary analysis of the program data to (i) evaluate its effectiveness in preventing acute malnutrition, and (ii) assessing the impact of local food supplementation in preventing nutrition deterioration in moderate wasting children and PBWG in regions without established TSFP programs.

**AIM AND OBJECTIVES OF PROPOSED SECONDARY ANALYSIS**

This secondary analysis aims to deepen the understanding of the effectiveness of using local foods to prevent acute malnutrition and to manage moderate wasting in case standard TSFP is not available. To achieve this, the study will aim to meet the following objectives:

**Objective 1:** Evaluate and compare the nutritional status of well-nourished children and PBWG at the start and conclusion of the BSFP+ program.

**Objective 2:** Evaluate and compare the nutritional status of well-nourished children and PBWG at the start and conclusion of the SBC+ program.

**Objective 3**: Assess and compare the nutritional status of moderately wasted children and malnourished PBWG at the beginning and end of the BSFP+ program.

**Objective 4**: Analyze growth patterns throughout the intervention period between children who respond to treatment and those who do not.

**METHODS**

***Secondary Analysis Design***

The proposed study is a secondary analysis of longitudinal cohort program data from well-nourished children aged 6-59 months, well-nourished PBWG, moderately wasted children aged 6-59 months, malnourished PBWG enrolled in Assida + for four to five months across four States in Sudan. Enrollment will be limited to the first distribution with no new study participants added at later distributions to ensure all those included will have received three to five months of intervention. Study participants will be monitored monthly with data collected at enrollment and at each subsequent BSFP+ and SCB+ Follow Ups. Due to substantial differences in context and resource availability across the regions, comparisons between regions will not be conducted. Nor will comparisons between programs be made.

***Population***

The analysis will include the following populations: (i) well-nourished children aged 6-59 months, (considered as all U2 with MUAC of >135mm and all children 2 to 5 years of age with MUAC of >125 mm), (ii) well-nourished PBWG, (iii) moderately wasted children aged 6-59 months, and (iv) malnourished PBWG. Moderately wasted children and PBWG included in the analysis are only the one that have been admitted into Save the Children’s BSFP+ program due to lack of TSFP, to prevent their further nutritional deterioration. For children, moderate wasting will be defined as either a mid-upper arm circumference (MUAC) of ≥ 115mm to < 125mm and/or a weight-for-height z-score (WHZ) of ≥ -3SD to <-2SD with no presence of nutritional bilateral oedema. Malnourished PBWG will be defined as a MUAC of <230mm. Also PBWG with infants U6m that have a MUAC ≤115mm have been enrolled in the cohort. Children and PBWG are enrolled at the point of the first BSFP+ distribution or first SCB+ session and followed monthly through the entirety of the four to five-month program.

***Data Collection***

At each monthly BSFP+ and SBC+ Follow Up session, participants are assessed for acute malnutrition, morbidity, and mortality, with both individual and household-level information gathered through questionnaires at program enrollment and each follow-up. Nutritional status is monitored through monthly anthropometric measurements including height, weight, Oedema and MUAC, along with oedema assessments. SBC+ Anthropometrics were only related to MUAC and Oedema measurements. Additional covariates collected via questionnaires include the participant’s age, sex, vaccination status, infant and young child feeding practices, and household characteristics, such as food insecurity, household size, educational attainment, displacement status, BSFP+ supplemental food ration utilization for those enrolled in the program, maternal survival status, and the sex of the household head. A complete list of collected variables are listed in Annex 1.

**Proposed Analysis Significance**

This analysis will contribute valuable evidence on the effectiveness of using local foods to prevent moderate acute malnutrition as well as to prevent deterioration of nutritional status in moderately malnourished U5 and PBWG in humanitarian settings, informing global policy on local food supplementation in contexts where specially formulated foods are either unavailable or local food baskets are more appropriate. As resources for addressing wasting become increasingly limited, there is growing interest in leveraging local foods to meet population needs. Evidence-based prevention and management strategies are essential, and this analysis aims to strengthen that evidence base. The results will:

1. offer insight into how well-nourished populations respond to local food supplementation during periods of extreme food insecurity, and
2. assess how moderately wasted children and PBWG respond to local food supplementation.

**Essential Tasks**

The following tasks are envisioned to be conducted over the course of the project and responsible parties are outlined below.

|  |  |
| --- | --- |
| **Activity** | **Timeline** |
| ***Ethical approval*** |  |
|  In-country IRB approval | Ongoing request |
|   |  |
| ***Consent*** |  |
|  Obtain consent from caregivers | Ongoing |
| ***Data Collection*** |  |
|  Develop data collection tools | Completed |
|  Develop database | Ongoing |
|  Enter all programmatic data | April/May |
| ***Data Analysis*** |  |
|  Initial cleaning of dataset | April/June |
|  Final cleaning of dataset | June |
|  Finalize data analysis plan | June |
|  Run data analysis | June |
|  Preliminary results discussion | July |
|  First manuscript draft | July/August |
|  Final manuscript for submission | August/September |

**Final Deliverables**

|  |
| --- |
| Clean dataset |
| Analysis code |
| Tables/figures |
| ManuscriptDissemination of results |

**ANNEX ONE – Variables Captured in Patient File**

* Child:
	+ Name, ID, date of birth (it will be anonymized in the dataset)
	+ Gender
	+ Age in years/months
	+ Enrolment: (i) new, (ii) Referral Discharged OTP + date, (iii) Referral Discharged TSFP + date
* Primary caregiver or PBWG directly enrolled:
	+ Name, ID, (it will be anonymized in the dataset)
	+ Age
	+ Enrolled PBWG (Y/N)
	+ Relationship to infant: birth mother, grand mother, other
	+ Enrolment: (i) new, (ii) Referral Discharged TSFP + date
	+ Birth Mother alive
	+ Father alive
	+ Primary caregiver Educational status: no, primary, secondary, higher levels
* Household characteristics:
	+ Household size #
	+ Number of children U5 in the household and their age
	+ Head of the HH Sex (M/F)
	+ Status: IDP, Host, Refugee, Returnee
* Anthropometric:
	+ [1] Oedema (0, +, ++, +++)
	+ [2] Weight (kg)
	+ [3] Weight change (g): ● If weight stable or decreased  refer the caretaker to IYCF counselling ● at second visit with stable or decreased weight  organise a home visit
	+ [4] Length (cm)
	+ [5] WLZ (z-score <-1, <-2, <-3, ≥-1)
	+ [6] MUAC – Child (cm)
	+ [7] MUAC – PBWG (cm)
	+ [8] Caretaker trained in Family MUAC and provided with MUAC tape (Y/N)
* IYCF U2 and PBWG ONLY, skip if >2y:
	+ [9] 0-23m: How many times per day you breastfeed your child? (Add #, and if no breastfeed is "0")
	+ [10] IF NO BREASTFEEDING: What was the age of your child when breastfeeding was stopped? (#, and explain what was the reason)
	+ [11] 0-23m: At what age have you started giving semi-solid or solid food to your child? (# months and explain what food was given)
	+ [12] PBWG: Yesterday, during the day or at night, did you consume any of the following? (any #: 1. Grains, white roots and tubers, and plantains; 2. Pulses (beans, peas and lentils); 3. Nuts and seeds; 4. Milk and milk products; 5. Meat, poultry and fish; 6. Eggs; 7. Dark green leafy vegetables; 8. Other vitamin A-rich fruits and vegetables; 9. Other vegetables; 10. Other fruits)
	+ [13] 0-23m: Yesterday, during the day or at night, did your child consume any of the following? (any #: 1. breast milk;2. grains, roots, tubers and plantains; 3. pulses (beans, peas, lentils), nuts and seeds; 4. dairy products (milk, infant formula, yogurt, cheese); 5. flesh foods (meat, fish, poultry, organ meats); 6. eggs; 7. vitamin-A rich fruits and vegetables; and 8. other fruits and vegetables.)
	+ [14] 0-23m: How many meals (solid, semi-solid, or soft foods) have you given to your child in the last 24 hours?
* Health:
	+ [15] During the last 3 months, did your child receive any dose of Vitamin A? (Y/N, if Yes, plan another dose 6 months after the last dose received, if Not  give a preventive dose based on age: >12m=200,000 IU; 6-12m=100,000 IU; < 6m=50,000 IU)
	+ [16] During the last 3 months, did your child receive any dose of Deworming? (Y/N, if Yes, plan another dose 6 months after the last dose received, if Not  give a preventive dose based on age: <12m=do not give; 12-23m=200mg Albendazole or 250mg of Mebendazole; ≥24m=400mg Albendazole or 500mg of Mebendazole)
	+ [17] EVALUATE: Did the child receive all vaccinations according to his/her age? If no, specify the missed dose/s and  refer to EPI)
	+ [18] Did your Child have any illness in the last two weeks (Y=Specify any reported Cough, Diarrhoea, Vomiting, Fever, Others/N)
	+ [19] If you are pregnant, did you attend any ANC session in the last 3 months? (Y/N, if no refer to ANC)
* Food security:
	+ [20] Did you receive other I/NGO food and non-food aid in the last month? (Y, specify/N)
	+ [21] Have you (if PBWG) or your Child been treated in the last 6 months for malnutrition (Y, write date of discharge /N)
	+ [22] QUESTION FOR THE CARETAKER: How many meals per day you consumed during the last week? (#)
* WASH
	+ [23] QUESTION FOR THE CARETAKER: When do you wash your hands? (1. After going to the toilet/latrine, 2. After cleaning the baby’s bottom/changing a baby’s nappy, 3. Before preparing/handling food, 4. Before feeding a child/eating, 5. After handling raw food, 6. After handling garbage, 7. Other Specify)
	+ [24] Do you have a handwashing tool at home (e.g. Tip Tap)? (Y, 1. With Soap, 2. No soap/N)
	+ [25] What is the HH main drinking water source? (1. Open water sources (i.e. canals/ponds/rivers), 2. Protected borehole/well/spring, 3. Unprotected borehole/well/spring, 4. Protected hand pump, 5. Unprotected hand pump, 6. Piped water to dwellings, water points 7. Water tanker / truck, 8. other (please specify))
	+ [26] Is water always available in enough quantity for your household needs? (Y/N)
	+ [27] What kind of toilet facility do members of your household usually use? (1. HH latrine, 2. Nearby latrine, 3. No latrine/open defecation, 4. Others-Specify)
* Ration utilization:
	+ [28] When did the last ration finished? (1. At first week, 2. At second week, 3. At third week, 4. At fourth week)
	+ [29] If the ration did last less than 4 weeks, explain why (1. Shared with other children in the HH, 2. Shared with other adults in the HH, 3. Shared with neighbouring HH, 4. Sold it out, 5. The prepared ration was spoiled by insects/animals)
	+ [30] Do you usually add any other food into Assida Plus? (Y/N)
	+ [31] EVALUATE: Ration received by the mother (Y, 1. Correct amount, 2. Less amount / N, if No explain WHY)
	+ [32] Was it difficult to access your Ration for any reason? (If yes, please explain why)
* Outcomes:
	+ Visit outcome: Outcome codes: A=Absent; R=Refuse to participate; RT=Referred to TSFP; RO=Referred to OTP; RHF=Referred to HF; RY=Referred for IYCF counselling; R-TSFP: Returned from TSFP; R-OTP: Returned from OTP; H=Home visit due to drop in weight or MUAC; X=died
	+ Date of next visit

Date: 13/04/2025



Signature:

Name PI: Fabrizio Loddo

Signature: 

Name PI: Janet Mugo