FANGAK COUNTY, JONGLEI STATE, SOUTH SUDAN







SEPTEMBER 2023 - AUGUST 2024



# EXECUTIVE SUMMARY

Acton Against Hunger has been implementing multisectoral programmes focusing on health, nutrition, food security and livelihoods, WASH, and child protection across various states in South Sudan<sup>1</sup>. In Fangak County, Action Against Hunger implements a 5-year, multi-sectoral project, which is part of its Right2Grow strategic partnership, comprising four national NGOs (CIDO, UNIDOR, SPEDP and CRC) and four international NGOs (Save the Children, World Vision, Action Against Hunger and CEGAA).

The Link NCA Nutrition Causal Analysis was conducted from September 2023 to August 2024 aiming to understand the causal mechanisms of undernutrition, notably wasting, in order to improve the relevance and efficiency of its nutritional security programming. Out of 20 studied risk factors, five were identified as having a major impact on the prevalence of undernutrition (wasting) in the study area, namely:

- a) limited access to health services
- b) low nutritional status of women
- c) low access to quality diet
- d) low access to income sources
- e) inadequate accessibility, availability and quality of water at household level

# METHODOLOGY

A Link NCA Nutrition Causal Analysis is a mixed method for analysing the multi-causality of under-nutrition as a starting point for improving the relevance and effectiveness of multi-sectoral nutrition security programming in a given context. It is a structured, participatory and holistic study that builds on UNICEF's conceptual framework with an objective to build an evidence-based consensus on plausible causes of undernutrition in a local context<sup>2</sup>.

The study in Fangak County included a review of secondary data sources and primary qualitative and quantitative data collection to maintain

a mixed method approach. The quantitative data collection was integrated into an annual SMART survey, to which additional indicators were added to collect evidence on studied risk factors. Despite the availability of secondary quantitative data from previous SMART surveys and the 2021 Food Security and Nutrition survey, the inability to merge children's data with their respective mothers and households hindered the possibility to explore statistical associations between available indicators and therefore a triangulation of data from various data sources.

## **KEY STAGES**

Systematic review of secondary data sources

was conducted in September-October 2023 and included more than 40 documents from multiple sectors (Health and Nutrition, Mental Health and Care Practices, Food Security and Livelihoods, Water, Sanitation and Hygiene, Gender). It covered past surveys and research applicable to the study zone with the aim of identifying a set of risk factors and their interactions, which might trigger undernutrition among children under 5 years of age (CU5).

The summary of the secondary data review, was presented to stakeholders and technical experts at an initial technical workshop, which was held on 17 October 2023 in Juba.

In-depth qualitative inquiry was conducted between October 2023 and November 2023 in four payams of Fangak County, namely Paguir, Old Fangak, New Fangak and Mareang. At village level, a variety of participants ranging from mothers and fathers of children under 5

# **KEY FINDINGS**

**CATEGORISATION OF RISK FACTORS** Among the major risk factors, two risk factors were identified in the health and nutrition Based on a triangulation of various data sector, namely limited access to health services sources (Cf. Key stages) risk factors of wasting, and low nutritional status of women, two risk per UNICEF conceptual framework, were factors were identified in the food security and categorised as major, important and minor livelihoods sector, namely low access to quality in relation to their believed effect on the diet and low access to income sources while one prevalence of wasting in the Action Against risk factor was identified in the water, hygiene Hunger intervention zone within Fangak County. and sanitation sector, namely inadequate Five risk factors were identified as having a accessibility, availability and quality of water at major impact, 11 risk factors were classified as household level. having an important impact and 4 risk factors were judged to have a minor impact on the prevalence of wasting in the zone of study.



years of age, community leaders, and Village Health Workers were requested to participate. In total, 47 focus group discussions and 39 key informant interviews were organized with 420 participants, out of which 286 were women. Additionally, the qualitative study included 34 comparative studies of malnourished children vis-à-vis their non-malnourished siblings.

**Primary quantitative data collection** was

conducted in March 2024. The annual SMART survey including anthropometry of children 6-59 months and their mothers was expanded by a series of indicators which were deemed relevant to the context following the qualitative inquiry. The final sample included 513 children.

Data synthesis was conducted from January to May 2024. The final results were presented to key decision-makers and operational partners in Juba on 29th August 2024.



# **KEY FINDINGS**

RISK FACTOR		FINAL INTERPRETATION
А	Limited access to health services	+++
В	Limited utilisation of health services	++
С	Birth spacing / early, recurrent or unwanted pregnancies	++
D	Low birth weight	+
E	Poor nutritional status of women	+++
F	Caregiver's well-being	++
G	Non-optimal breastfeeding practices	++
Н	Non-optimal complementary feeding practices for children and a acaregiver	++
I	Low quality of interaction between the child and the caregiver	+
J	Low access to quality diet	+++
К	Low access to income sources	+++
L	Limited access to markets	++
м	Low coping capacities	++
Ν	Inadequate accessibility, availability and quality of water at household level	+++
0	Non-optimal sanitation practices	++
Р	Non-optimal personal hygiene practices	++
Q	Non-optimal food hygiene and environmental practices	++
R	Intensive workload experienced by women	++
S	Low female autonomy / decision-making powers	+
Т	Low social support for women	+

The categorisation of risk factors identifies to the nearest health facility varies from 1h to the same three major factors raised by the 4h by canoe and seeking medical help often communities, namely limited access to health takes the whole day. Renting a canoe is very services, limited income sources and inadequate challenging as canoes are considered crucial accessibility and availability to quality water. assets for income generation. Time barriers are Additionally, low nutritional status of women linked to women's workload as mothers are and low-quality diet were classified as major engaged in back-to-back activities throughout due to the strong association of the respective the day. A visit to the health facility translates indicators with wasting in the secondary data into a full day of missed work. Financial barriers review and/or on the basis of primary data Renting a canoe to reach the health centre is analyses (SMART 2024). It is important to note expensive. To the transportation costs, a trip that three out of five of these risk factors are to the hospital also includes cost of eventual directly linked to the reduced quality of diet and medicines and accommodation. if the visit its effect on women and children' nutritional requires an overnight stay. Services are free at status, highlighting the importance of focusing the point of access for children under-five and programmatic responses on increasing access to women of reproductive age but medicines are additional local food sources to diversify diets of often not available and need to be purchased both children and their mothers. separately. Quality of care is compromised mostly by the lack of medicines, combined with SIGNIFICANT QUALITATIVE RESULTS long waiting time. Private clinics in markets serve as an alternative source of medicines. **Perception of acute malnutrition** Health facilities offer reduced services and The community perceives two main forms of refer patients to the nearest hospitals for wasting: one characterised by a child born specialised treatment, further contributing to with a large head (Giath) and a very thin

## Β.

treatment delays. body, and another form where a thin body was accompanied by a prolonged chest or Low nutritional status of women humpback (Giath-luoth). Loss of weight, lack of Working long hours far away from home, appetite and fever were perceived as common mothers reported not eating enough food which symptoms. Kwashiorkor was easily recognised was perceived to cause the reduction of the through the swelling of the body, caused by the guantity of breastmilk they produced. The dry accumulation of water or air in between the season, especially the months from March to flesh. Swelling was also linked to a deficiency July, are very difficult for women as there is of white blood cells. The treatment of wasting less available food. During this period women and kwashiorkor included the administration consume only one meal per day in the evening of traditional herbal infusions and body cutting relying extensively on wild foods as well as procedures as well as going to the health centre. water lily, keeh<sup>3</sup> and guan<sup>4</sup>. Single, widowed Since 2019-2020, the number of wasting cases or divorced women were said to be the most increased. This rise was primarily attributed vulnerable as they have reduced support and to the decreased quantity and quality of food, have to care for their children alone. especially due to a significant loss of cows and Sub-optimal breastfeeding therefore milk, and the persistently wet and Mothers reported having insufficient milk due humid environment.

## Limited access to health services

Distance is considered the biggest geographical barrier, which delays or hinders community access to health services. The average distance



to their limited diet. They admitted resorting to alternative options such as giving milk or the upper part of yogurt (piwcaak), fish broth from Tilapia or Lek (without flesh), or even powdered milk if available from the market. Not having

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enough milk and hearing their child crying because of hunger makes them worry as there are not many alternatives Breastfeeding is more difficult in the first half of the year when the weather is hotter and there is less food. Heavy workload away from the house negatively impacts the ability to breastfeed on demand as mothers leave children for several hours in the care of other siblings or neighbours. Children are breastfed mainly in the morning and at night meaning that they stay hungry during the day. Spending many hours in the river or under the sun is perceived to spoil breastmilk, milk becoming hot or cold and as such causing diarrhoea in children. Breastfeeding is interrupted when a mother becomes pregnant with a new baby as it is believed that continued breastfeeding during pregnancy could potentially make the child sick.

## Low access to quality diet

The community's diet has drastically decreased in both in guality and guantity since the onset of the floods. Typically, meals are consumed twice a day, morning and evening, with a reduction to once a day during the first half of the year. The typical diet includes walwal, a sorghum-based runny porridge, and fish or kop, boiled sorghum formed into small balls, with fish sauce for breakfast or dinner. The diet is then expanded with vegetables such as pumpkin, okra, onion, aubergine, sweet potato, and various green or wild leaves. From August to December, the community enjoys a wider range of vegetables alongside fish and maize harvest in August. Sorghum is mostly provided through WFP food rations every 3-4 months. When the stocks run out, people purchase it from the market or replace it with water lily (yiel). Communities started consuming water lily seeds regularly since the beginning of the floods in 2019-2020. It is the women's role to search for water lily in the river, spending long days looking for bulbs. Water lily is usually collected between July and November and stored for 6 months. When the availability of bulbs decreases, women switch to collecting keeh, which is the root tuber of

water lily. Keeh is considered the last resource in times of severe food scarcity and its mostly eaten in the lean months. The community perceives waterlily as unpalatable, bitter, and a cause of constipation, haemorrhoids, reduced urination and stomach aches particularly affecting children under-five. Conversely to the community's perceptions, findings of a recent review on waterlilies and lotus showed that the rhizome and seeds are rich in essential nutrients such as protein, dietary fibre, carbohydrates, amino acids, fatty acids, vitamins, and minerals and can contribute to a balanced diet

### Low access to income sources

Most men engage in local fishing or migrate seasonally to fish larger quantities in deeper waters. Time spent away varies from a few months to 6-8 months or even longer. Secondary income sources include selling charcoal, wood, or reeds. . Traditionally, men are expected to do work outside the house, but the ongoing challenges have shifted these gender roles. Nowadays, women engage in some income-generating activities such as grinding sorghum and maize to sell at the market, collecting firewood, fetching water and selling chickens, vegetables, green leaves. Only few women sell tea and coffee at the market because this type of business is linked to the perception of a woman being promiscuous and requires the husband's consent. Income sources are limited throughout the year, but the most challenging period is the dry season.

## Inadequate accessibility, availability and quality of water

Communities drink unprotected water from the nearby rivers and swamps Most boreholes are either not working or far away. The community attempted to construct basic wells but these usually collapse with the start of the rainy season. Open defecation, solid waste and presence of domestic/wild animals were observed around the water fetching points. Water is often not treated and drank immediately despite awareness about the need to boil water. Several barriers to implement this practice are lack of large pans and the need to boil water multiple times a day, use extra leaves or charcoal for fire and lack of time.

### **STATISTICAL ASSOCIATIONS** С.

Risk factors for wasting based on one or (MDD), a child that was taken to the health multiple indexes (weight/height, MUAC or centre for treatment of diarrhoea or fever and a combined weight/height and MUAC) included child that had a clean face and hands at the time a child living in a house that was further from of the survey. the main water point, a child delivered at home with the support of a friend or a child Additionally, common risk factors between that lived in a household that had debts at stunting based on height/age and underweight the time of the survey. In contrast, protective based on weight/age included being a male factors for wasting based on one or multiple child and having a mother currently lactating indexes included a child living in a household at the time of the survey. No common with higher numbers of cattle or in one that protective factors were found between harvested crops the previous year. A child living wasting based on multiple indices and stunting in a household with a higher diet diversity based on height/age. score, or specifically consuming meat (including fish) or oil/fat, consuming a higher number **PATHWAYS** of food groups according to their minimum diversity score (MDD) or consuming porridge Community perception. According to the or meat in the 24h prior the survey reduced community, undernutrition is caused by poor the probability of a child being wasted. Lower access to income due to the lack of incomerisk of wasting was also found for a child that generating activities in the study area, especially received pentavalent and measles vaccinations since 2020. The main outlined reasons were before the first birthday or that was taken to the unavailability of arable land and loss of health centre for treatment of diarrhoea or livestock due to four years of recurrent floods fever. Additionally, a child that was initiated to which have drastically reduced the population breastfeeding within one hour from birth or one income and food sources. As a result, access that was observed having a clean face and body to guality food compounded by the restricted at the time of the survey was also less likely to access to markets, is extremely limited with be wasted. Vulnerability to wasting decreased most of the population relying on food rations for older children. and water lilies to survive. This has a direct effect on women's nutritional status - and their Most overlaps of risk and protective factors ability to breastfeed their children as well as were observed between wasting and complementary feeding practices. At the same underweight. One common risk factor between time, poor access to income increases women's wasting based on weight/height index and workload, further exacerbated by low social underweight based on weight/age index support, consequently having a negative effect included a child being delivered at home with on maternal mental wellbeing. Mothers often the support of a friend. In contrast, common feel exhausted and overwhelmed due to the protective factors for wasting based on one household and food sourcing responsibilities. or multiple indexes (weight/height, MUAC This often translates in sub-optimal care or combined weight/height and MUAC) and practices namely limited breastfeeding and



underweight based on weight/age index included being an older child, a child who lived in a household with higher diversity score or in household that consumed meat (including fish) or oil/fat in the 24h prior the survey, a child that consuming a higher number of food groups according to their minimum diversity score



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complementary feeing practices, reduced interactions with their children as well as suboptimal child personal hygiene practices. Children are frequently left for long hours in the care of siblings, neighbours or other family members.

Moreover, low female decision making leads to early and repetitive pregnancies and translates into low birth weight. Women, often agree to have sexual intercourse within the first year from delivery to prevent their husbands from having concubines and losing potential resources for the family. Simultaneously, the

flooded environment makes it extremely difficult to access health facilities, if not close by the village, impacting the use of health services and often delaying treatment for children. Lastly, access to quality potable water compounded by open defecation practices as a result of lack of latrines leads to overall poor environmental hygiene which translates in poor hygiene practices for children that often play on muddy soil, walk around in dirty clothes or without shoes which increases their risk to water-borne diseases.



### Figure 1: Community perceptions of casual patterns of undernutrition in Fangak County

The causal pathways presented below are based on the pathway constructed during the community consultations, while the results of statistical analyses have been added to visually summarise the evidence available for each form of undernutrition. It is important to note that statistical associations are not systematically valid for all forms of undernutrition.

### Wasting<sup>5</sup>

On the basis of the available evidence, three causal pathways built around nine key risk factors can explain most cases of wasting in the study area. Firstly, limited access to income contributes to poor access to quality diet leading on one side to sub-optimal nutritional status of mothers which hinders optimal breastfeeding practices and on the other side to sub-optimal complementary feeding practices.

On the other hand, the flooded environment poses considerable mobility challenges to reach health centres negatively affecting the use of health services while, at the same time, inadequate accessibility and availability of water leads to sub-optimal environmental hygiene and consequently personal hygiene practices increasing children's vulnerability to infections and subsequently wasting.



Figure 2: Causal diagram of wasting, Fangak County<sup>6</sup>

## **COMPARATIVE STUDY**

These perceptions were corroborated in a study comparing malnourished children with It is important to note that the current situation their non-malnourished siblings, during which has been strongly influenced by the recurrent mothers highlighted the cumulative effect of floods since 2020 which have destroyed limited financial resources, heavy workload and livelihoods, assets and the community's ability receiving minimal support during pregnancy and to be auto sufficient. As a result, they remain in while breastfeeding. More than half women in a constant cycle of extreme poverty and fight the sample stated to have had a malnourished for survival which leaves them depleted, often child while single or widowed. Additionally, resorting to multiple coping strategies while every other woman reported worse mental being heavily dependent on humanitarian aid. health while pregnant with their malnourished Men attempt to bring income and food through child. In most cases, malnourished children the few income generating activities available were reported to be born smaller than their but this takes them away from home for many non-malnourished siblings, were typically the months. During this time, women take on younger child, and had poorer health status the heavy burden of household and childcare while breastfeeding. The situation was further responsibilities while trying to provide enough aggravated by the lower quantity and quality foods consumed during pregnancy and lactation food for themselves and their children with the which had negative repercussions on IYCF limited resources available.



practices and an overall worse health status during lactation.



# RECOMMENDATIONS

Based on these results, the following activities are recommended for incorporation into the Right2Grow project and/or complementary projects implemented in the study area:

- Disseminate the main findings of this Link NCA study to Action Against Hunger project partners, authorities and civil society in Fangak County to ensure that these are accounted for in their programmatic responses, specifically focusing on intervention targeting women of reproductive age and children under 5 years of age.
- Expand a variety of income sources to decrease households' dependence on humanitarian assistance, improving their economic stability and resilience. This could be done by assisting communities to mindfully manage natural resources, e.g. by strengthening fishing (and/or fish farming) and fish transformation activities, introducing crops which flourish in wetlands, for example rice, arrowroot, banana, sugarcane or bio-fortified crops, among others and/or introducing poultry, such as chickens or ducks, which could also contribute to a higher food diversity in the household. Additionally, provide food preservation skills to increase food diversity during the lean season.
- Engage the community in SBCC interventions focused on women's health, including nutrition before, during, and after pregnancy, as well as breastfeeding, involving men as key decision-makers within the household.
- Introduce mobile clinics, such as boat clinics, to reduce barriers to healthcare services among the most isolated communities and those that are displaced due flooding. Additionally, strengthen referral systems from the community to health facilities to ensure timely access to

care. Access to health services could also be improved via community health worker networks, bringing essential services closer to the communities to improve the quality and scope of health services provided at states service points (health centres) by ensuring that sufficient staff and medicine are available throughout the year, but especially during the peak periods of recurrent illnesses.

- Increase awareness of the benefits of boiling water collected from the swamps before drinking to prevent disease. This could be also done by reviving traditional knowledge of creating pots from mud to boil water in larger quantities to overcome the lack of cooking utensils.
- Support the development of new boreholes and the renovation of existing ones, ensuring a sustainable transfer of infrastructure to the community.
- Facilitate a creation or strengthening of community structures, particularly for women, aiming to create safe space for information sharing, learning and social support.
- Advocate for the introduction of solar energy projects, enabling communities to benefit from electricity for daily use, including solar powered boats, water pumps, telephone network, etc.
- Stimulate a community dialogue aiming to seek community-based or household-based solutions for priority concerns, reducing the vulnerability of the populations dependent on humanitarian assistance.

Other recommendations:

• Promote peace and stability in Fangak County while strengthening basic services, such as health, markets, and education, to enhance community access and utilisation.

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# LIMITATIONS

### Lack of secondary data.

Despite availability of multiple SMART surveys and the 2021 Food Security and Nutrition survey data, the inability to merge children's data with their respective mothers and household data hindered our ability to run additional regressions and explore associations across various data sources.

## Statistical associations.

It is advisable to assess statistical associations with caution as observed links do not necessarily prove causality, while unobserved links do not mean that causality does not exist.

## References

- https://linknca.org/etude/former\_renk\_county\_upper\_nile\_state.htm, not cleared 1 for publication.
- 2 For more information about the methodology, please refer to www.linknca.org.
- 3 Root tuber of the waterlily.
- 4 Wild fruit found in the forest and eaten boiled.
- 5 A form of acute malnutrition.
- 6 Red cells represent risk factors significantly associated with acute malnutrition (wasting), while green cells indicate protective factors significantly associated with acute malnutrition (wasting), based on p-value calculations < 0.05. Grey cells represent risk factors supported by the available evidence.



## **Confounding variables.**

The statistical analyses carried out in this study are based on unadjusted regression models that do not consider the effects of confounding variables.

## Team composition.

The qualitative team was mostly composed of male members due to limited research and translation capacity in Fangak County. This imbalance affected the ability to engage in gender-sensitive conversations.









