Food and Agriculture Organization of the United Nations

Tufts UNIVERSITY | FRIEDMAN SCHOOL OF NUTRITION SCIENCE AND POLICY
Feinstein International Center

Twin peaks: the seasonality of acute malnutrition, conflict and environmental factors in Chad, South Sudan and the Sudan

Mind the gap – briefing paper 1

Bridging the research, practice and policy divide to enhance livelihood resilience in conflict settings


©Anastasia Marshak

This is the first in a series of three briefing papers that form part of the Mind the gap – Bridging the research, practice and policy divide to enhance livelihood resilience in conflict settings project, a collaboration between the Food and Agriculture Organization of the United Nations (FAO) and the Feinstein International Center, Friedman School of Nutrition Science and Policy at Tufts University.

This briefing paper accompanies a report that highlights major new findings on the seasonal patterns of child malnutrition and their links to climate variability, conflict and livelihood systems in Chad, South Sudan and the Sudan.

This work highlights the need for greater consideration of the wide-ranging climate, conflict and other shocks that affect communities and how communities adapt to or cope with different types of shock.

Key messages

- Livelihood adaptation to environmental variability in the study areas in Chad, South Sudan and the Sudan has been undermined by a long history of shocks and other externalities. An understanding of this continual threat to resilience must start with an understanding of dryland farming and pastoralism as practiced by specialist producers as part of a wider regional livelihood system that is designed to mitigate and manage shocks.

- The specialist experience of different livelihood producers and their coping response strategies should influence programming and targeting decisions, matching inputs and technical support to specific gaps in knowledge and experience (i.e. it may be the herder who needs advice about farming). Gender roles and responsibilities within the specialization and in relation to diversification of livelihoods are a critical concern.

- Peace does not necessarily bring a dividend. The impacts of conflict and related shocks may continue at the individual, household and community level for years or even decades, with implications for livelihoods, nutrition and food security.

- Conflict analysis needs to better understand and incorporate the seasonality of conflicts and local mitigation responses and their implications for peace-building. Post-conflict assessments and programming need to take into account that recovery is not uniform. The marked improvements of some groups may mask a decline or stagnation of others.

- The evidence of persistent global acute malnutrition and extreme seasonal peaks illustrated in the first case study challenges widely held views that associate seasonal increases in child malnutrition with the lean season. Current approaches that take a short-term outlook or only undertake surveys once or twice a year risk ignoring seasonality and missing completely the opportunity to sustainably address the root causes of malnutrition in these contexts.

- Local history, perspectives and experiences are central to developing this context-specific understanding and effective programming. A participatory approach is needed to contextualize programmes aimed at sustainably addressing child malnutrition, livelihoods building, conflict mitigation or recovery.

- Several methodological considerations emerge from this analysis regarding the timing and frequency of data collection, the assumption of causality and the limitation of experimental approaches such as randomized control trials, which have not been sufficiently contextualized.

- Considerations of seasonality and environmental variability must be more deeply ingrained into dryland nutrition programmatic and research thinking. There is no better way to do this than by incorporating these considerations as part of the basic causes of malnutrition.

Methodology

This report draws on analysis of secondary data in addition to our primary qualitative work in eastern Chad and western Sudan. To understand intra-year trends in nutrition, survey records from 1995 through 2015 were abstracted from three countries (350 surveys, with 260 771 individual child observations).[1] External data on conflict (Armed Conflict Location and Event Data, or ACLED), climatic shocks (floods and droughts), epidemics (Emergency Events Database, or EM-DAT) and environmental drivers (temperature, precipitation and vegetation) were aggregated to spatially and temporally match Standardized Monitoring and Assessment of Relief and Transitions (SMART) data. We explored each data set separately to understand seasonal trends (aggregation by month over the full duration of available data). The analysis also combines all the secondary data to better understand how environmental fluctuations and presence of human-made or climate shocks correlated with changes over time in acute malnutrition.

Livelihood adaptation to environmental variability undermined by history of shocks/externalities

Livelihood diversification as a coping response is a widespread strategy.

Dryland farming and pastoralist production systems are intrinsically adapted to the extreme rainfall variability, ecological diversity and seasonality that characterize dryland contexts. They each have well-rehearsed strategies for managing delayed rains and drier spells. Dryland producers expect both good and bad years, with the former compensating for the latter and thus their agricultural outlook extends far beyond a single season or year. The relationship between these livelihood systems and their integration is fundamental to their adaptation and to their resilience to shocks, their peaceful coexistence and their sustainable co-management of natural resources.

Despite this intrinsic adaptive capacity, over the past five decades a wide range of externalities have contributed to pivotal changes and transformation of these traditional livelihood systems. All case-study regions have experienced a long history of protracted conflict, climate and other shocks. Many livelihood transformations that have taken place are rooted in the lived experiences of coping continually with threats, risks and hazards of all types

Livelihood diversification as a coping response is a widespread strategy. In the Darfur region of the Sudan, for example, pastoralists started to diversify into farming following the great 1980s famine and farmers diversified into raising livestock even before that. In addition,

[1] All surveys used the 30-by-30 nutrition anthropometric survey design as standard per the Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology. See UNICEF & USAID, 2006, Measuring mortality, nutritional status and food insecurity in crisis situations: SMART methodology [online], https://www.ennonline.net/attachments/888/smart-methodology-08-07-2006.pdf.

casual manual labour and trade of natural resources have expanded and are the marginal activities pursued by an increasing proportion of the population.

Agricultural expansion and intensification of land use for different purposes have increased competition over natural resources, especially in areas where there is shared use traditionally. Furthermore, agricultural expansion and land use intensification have implications for child labour and women's workload. Over time, these coping responses have led to changing patterns of land use and have undermined the former symbiotic relationship between livelihood groups.

Continuing fragility and tenuous peace require a cautious outlook post-conflict

Experience of conflict is associated with a loss of livelihoods, an increase in social inequities, slower recovery and heightened vulnerability. Conflict in the Darfur region of the Sudan, for example, continues to have profound implications many years after the conflict seemingly ended. Farmer–herder conflict polarizes production systems that traditionally depend on integration, shared use of natural resources and symbiotic economic and social exchanges.

> Conflict follows distinct seasonal patterns.

Our analysis shows that conflict follows distinct seasonal patterns. Violent conflict events were reported, especially in the harvest season (October–January) and in the dry season (March–May) and to a lesser extent in the rainy season (Figure 1). Our field research and a subsample of ACLED data both indicate that farmer–herder conflicts intensify during drought years and during the harvesting period (Figure 2). Producers believe farmer–herder conflict is more common in drier years compared to better rainy seasons. Producers also face hazards due to the direct and indirect effects of conflicts, which are highly seasonal.

Analysis: conflict follows distinct seasonal patterns in the regions of interest in Chad, South Sudan and the Sudan

Figure 1. Number of violent conflict events by month in the regions of interest in Chad, South Sudan and the Sudan

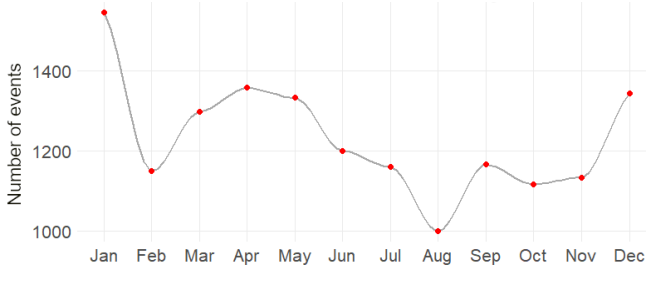
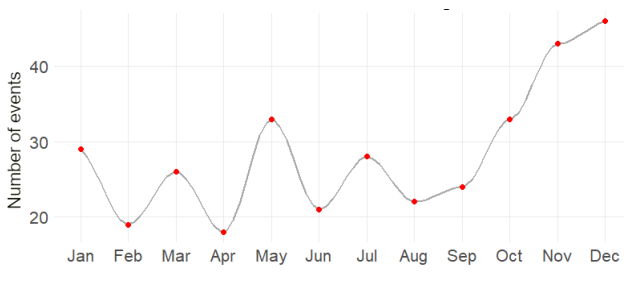


Figure 2. Number of farmer–herder violent conflict events by month in the regions of interest in Chad, South Sudan and the Sudan



Source: ACLED data (1997–2015)

Farmer–herder conflicts intensify during drought years and during harvesting.

Producers in these regions have developed strategies for dealing with conflict, which are distinct from their adaptive drought responses. These responses often entail trade-offs. For example, herds may be divided and/or moved to more distant places to avoid security threats. Routes are also often adjusted depending on the threat.

This movement cuts people off from the herds as a source of income and nutrition. It also separates young male herders from dependent family members. Smaller herds or milking animals are often kept closer to the settlement, especially in the dry season. This allows access to milk products but leads to overgrazing and the spread of animal disease.

New findings on seasonality of child acute malnutrition

The findings show a strong influence of climate and environment on nutritional status, combined with the seasonality of livelihoods and links to drivers of malnutrition.

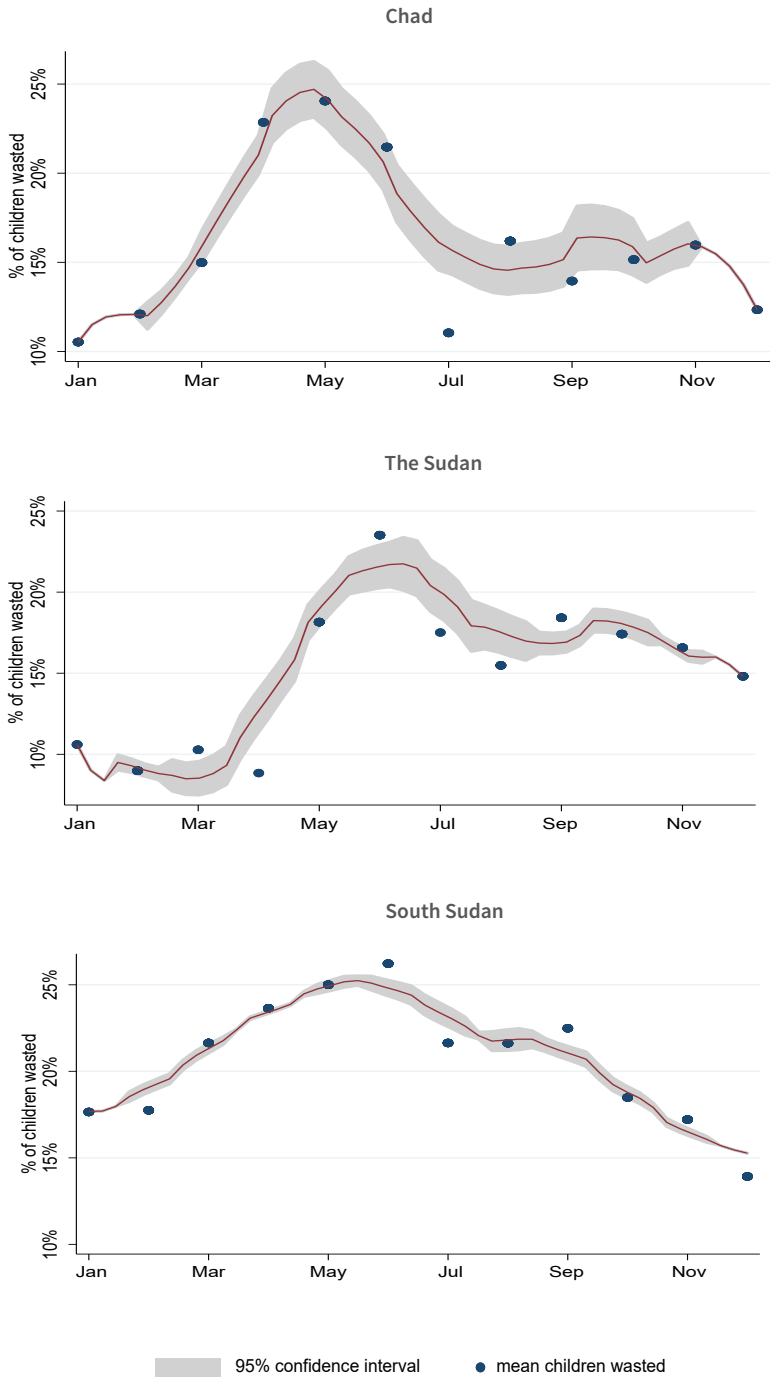
Chad, South Sudan and the Sudan have continually presented high rates of global acute malnutrition over the past 25 years, with rates regularly exceeding the emergency threshold of 15 percent. Rates of acute malnutrition follow a clear seasonal pattern, as do mean weight-for-height z-scores (WHZ),[2] indicating that the entire survey population and not only the malnourished in these study regions, is experiencing extreme seasonal shifts.

However, the seasonal pattern in Figure 3 varies from the widely held assumption that the peak of acute malnutrition corresponds to the peak of food insecurity at the end of the lean season. Instead, we observe twin peaks in global acute malnutrition. One peak is at the end of the dry season and start of the first light rains. The other peak is at the end of the rains (the lean season). The peak observed at the start of the rains tends to be larger and is followed by an improvement in population-level child nutritional status before the onset of the second peak (Figure 3).

Combining the global acute malnutrition, precipitation, temperature, normalized difference vegetation index (NDVI), which measures the presence of live green vegetation in the area and conflict data using regression analysis, we find that NDVI most closely and positively corresponds with child acute malnutrition. As the greening of the landscape increases (peaking in August/September), WHZ begins to improve. Temperature, on the other hand, is significantly and negatively associated with WHZ. As temperature increases, WHZ falls. In addition, when there were more conflict events in one year, children's nutritional status was significantly worse. By contrast, when broken out individually, precipitation and experience of flooding, drought or epidemics were insignificant. Taking all these variables together (precipitation, temperature, NDVI and conflict) explains 31 percent of the variation in population-level nutritional status over time. This confirms the strong role of climate in nutritional status.

[2] Weight-for-height z-score below −2 (WHZ < −2) and/or oedematous malnutrition.

Figure 3. Prevalence of wasting across months in Chad, the Sudan and South Sudan



Source: SMART nutrition survey data 1994–2015. Authors' own analysis.

The role and importance of environmental variability and seasonality in drylands need to be deeply ingrained into nutrition policy, programme and research.

From a more local-level perspective, a 2018 Feinstein study of seasonality of child acute malnutrition found that Darfuri women identified the end of the hot dry season as a difficult time (especially for pastoralists) and as the time of year when child malnutrition is more likely to occur.[3] Darfuri women farmers and pastoralists both linked this period with significant seasonal changes in livelihoods, workloads and environmental conditions.

The findings above show a strong influence of climate and environment on nutritional status, combined with the seasonality of livelihoods and links to drivers of malnutrition. Taken together, these findings suggest an overriding role for livelihood systems, environment and seasonality as factors driving the three clusters of underlying causes related to food security, care and health.

An analysis of the drivers of malnutrition using a livelihood lens potentially generates insights into household livelihood goals and decision-making. A livelihoods approach also sheds light on the many challenges and trade-offs families make when facing seasonal constraints and series of idiosyncratic and covariate shocks. As part of this livelihoods approach, we need to understand the intra-household gender dynamics, the labour shifts and trade-offs required to diversify livelihoods and the impacts on different household members by gender and generation.

Currently, malnutrition causal frameworks[4] do not include a temporal dimension, nor do they consider how seasonality and shocks impact livelihoods and the underlying causes of malnutrition. This gap in the analysis of malnutrition risks ignoring acute malnutrition when it is at its worst and thus potentially misses crucial opportunities for its prevention. The impact of interventions is likely to be lessened without an understanding of how climate variability and seasonality affect different livelihoods, malnutrition and its underlying causes.

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[3] Young, H. & Marshak, A. 2019. *The seasonality of malnutrition and its drivers in the Darfur region of Sudan.* Working paper: Building Resilience in Chad and Sudan project, Concern Worldwide, Feinstein International Center, Friedman School of Nutrition Science and Policy at Tufts University.

[4] The most widely adopted malnutrition causal frameworks are based on the original UNICEF malnutrition causal framework. See UNICEF, 1990, Strategy for improved nutrition of children and women in developing countries: A UNICEF policy review, New York.

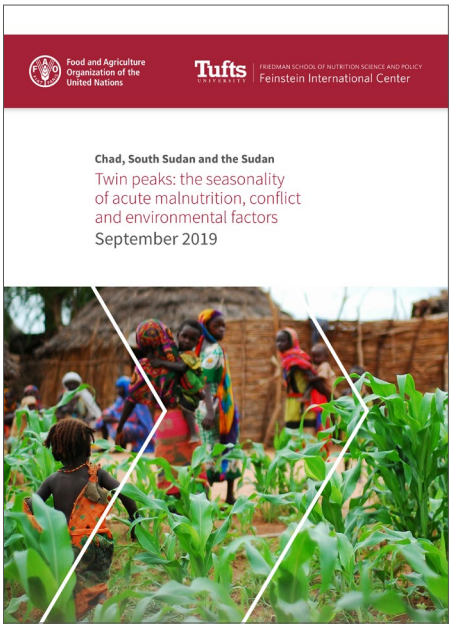
These findings have several practical implications for programmes and policies intended to address acute malnutrition and research in both humanitarian and more stable settings.

From the start, the role and importance of environmental variability and seasonality in drylands need to be deeply ingrained into nutrition policy, programme and research thinking. This can be achieved by adapting the malnutrition causal framework at the level of basic causes by further articulating the role of environmental variability, seasonality and livelihood systems as drivers of the underlying and immediate causes of malnutrition.

A case-by-case approach based on a deeper understanding of the seasonality of malnutrition and its drivers would allow interventions to be tailored according to the local conditions that are driving acute malnutrition during the peak periods and for different groups. This case-by-case approach is very different from the package of technical interventions designed for treatment of acute malnutrition.
The seasonal timing of programmes intended to reduce child malnutrition needs to align itself with the seasonal livelihood challenges that have a knock-on effect on the underlying causes of malnutrition. Gender roles and responsibilities within the livelihood specialization and in relation to response strategies are a critical concern.

The work of this study highlights the need for greater consideration of the wide-ranging climate, conflict and other shocks that affect communities and how communities adapt to or cope with different types of shock. Taking account of local-level perspectives and experience provides a deeper understanding of impact and helps to identify locally supported and more sustainable solutions.

A final challenge is the education of stakeholders at all levels about these more recent findings and supporting them to shift from "business as usual." A learning approach to capacity building will help narrow the gap between research, policy and practice to the benefit of dryland communities.



Full report available online at:
www.fao.org/3/ca5761en/CA5761EN.pdf

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