



# Mount Kulal Evidence Brief

December 2021

Feinstein International Centre, Tufts University

## Introduction

In 2021 the Nawiri project conducted a community-level analysis of the seasonality and basic causes of acute malnutrition in Marsabit and Isiolo Counties in Kenya. In Marsabit the analysis included field work in Loiyangalani ward, with a pilot exercise in Mt. Kulal. The findings from the exercise have been presented in a separate report;<sup>1</sup> however, for methodological reasons, the analysis did not include the results from Mt. Kulal, which are presented in this briefing paper.

The key questions for the analysis were:

- What is the seasonality of malnutrition and related factors?
- How do communities describe and prioritize the causes of malnutrition in children and mothers?
- What are community participants' suggestions and priorities for improving nutrition, and what is the reasoning behind their views?

In addition to answering these questions, the analysis also had a methodological component and aimed to adapt and test the use of participatory epidemiology (PE) for understanding malnutrition.

## Overview of methods used

The analysis is built around two PE methods, viz., a monthly calendar and a casual diagram. The design of these tools was informed by an ethnographic review on local language terms around nutrition prior to the field work. The causal diagram involves asking participants to identify what they believe are the key causes of malnutrition for both women and children, using a photograph of malnourished children/mothers as prompts and using local language terms identified during the ethnographic exercise. Once participants have identified all the causes, they are asked to assign a score to each cause (indicator). Scoring is done by distributing 100 counters among the different indicators, with more indicators being assigned to the more-important factors and fewer counters to less-important factors. Visual aids are used to facilitate the exercise, which also involves in-depth discussions around each indicator.

The monthly calendar exercise involves asking the participants to show the monthly variation of different indicators such as rainfall, human disease, food availability, and child malnutrition. This exercise is done by asking the participants to distribute 100 counters across each of the 12 months of what they consider a reasonably typical year with a relatively normal wet season. For example, participants will be asked to show

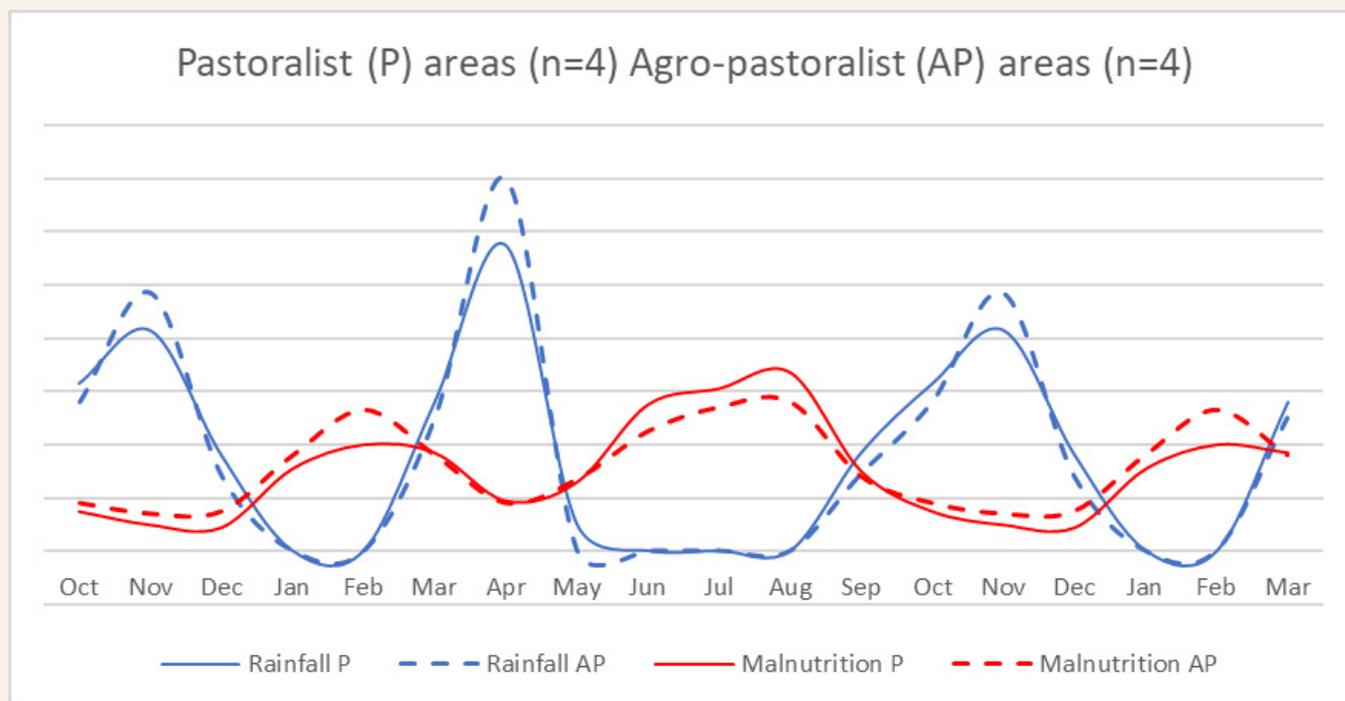
<sup>1</sup> Burns et al., 2021a.

in which months of the year they normally receive the most rain, and they will be asked to assign the most counters to that month. They will then be asked to distribute the rest of the counters based on the relative amount of rain they receive for each month of the year. Once consensus on the pattern of rainfall has been reached, the participants will be asked to do the same for the next indicator. Local terms for the different months are used and confirmed with participants by identifying a major activity or event that occurs in each month. This event is used as a reference to make sure the researchers and participants are always talking about the same month. The exercise provides a basis for discussions around each indicator. For example, participants will be asked why goat's milk is more readily available at a certain time of the year and not another. Once all the indicators have been scored, the researchers and participants collectively analyze and discuss the patterns between the different indicators and discuss the relationship between them. The exercise is then repeated, using the exact same indicators and number of counters, with different groups in the assessment area.

After completing the causal diagram and monthly calendar exercises, participants are asked to identify interventions that from their perspective will address malnutrition, considering the causes, seasonality, and other factors relating to nutrition that have been discussed. A detailed description of the methods used is available in a separate report.<sup>2</sup>

In Mt. Kulal, the analysis was carried out in four pastoralist villages and four agro-pastoralist villages.

**Figure 1. Monthly patterns of malnutrition.**



*Notes*

The diagrams were produced from the total summated scores for the indicators and months from four independent groups of pastoralists and four independent groups of agro-pastoralists; the data were not summarized using averages. There is no y-axis scale because the number of counters used has no absolute meaning; the lowest level of malnutrition (or any other indicator) shown does not necessarily mean a level of zero. A total of 100 counters was available for each indicator, for distribution across the 12 months. An 18-month timeframe is used on the x-axis to clearly illustrate monthly patterns at the beginning and end of the year.

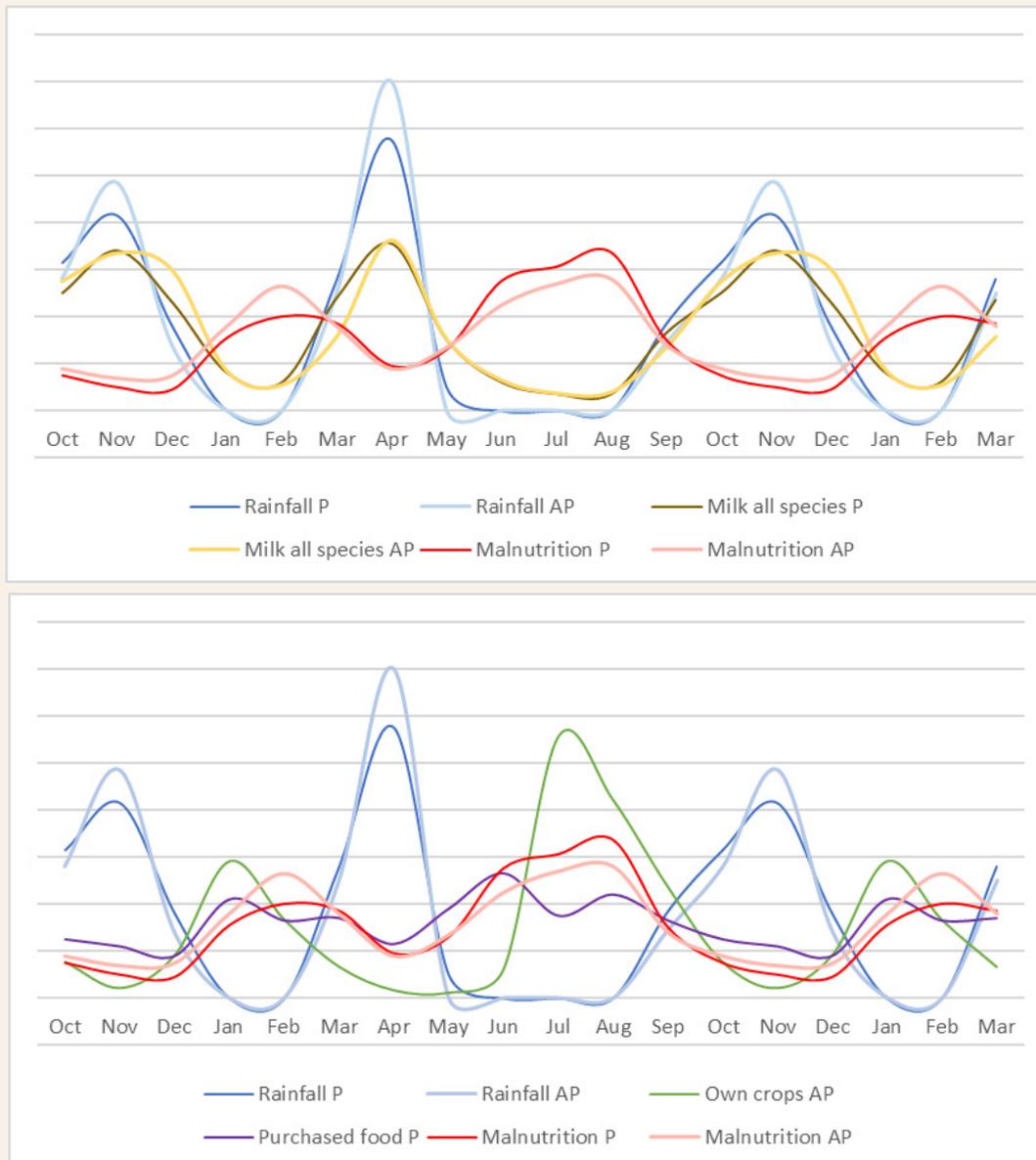
<sup>2</sup> Burns et al., 2021b.

## Seasonality of malnutrition and related factors

The results from the monthly calendar exercise showed child malnutrition increasing during the dry season for both the pastoralist and agro-pastoralist groups (Figure 1). From the perspective of participants, malnutrition cases peak during the long dry season in August, with a smaller peak being observed during the short dry season in February.

**Lack of milk:** Participants largely attributed temporal increases in malnutrition to a decline in milk yields during the dry spells (Figure 2). Although the agro-pastoralist groups harvest and consume crops from their own farms during this period, this consumption does not appear to have much impact on malnutrition or offset the reduction in milk available for consumption during this period (Figure 2). Similarly, although the

**Figure 2. Monthly patterns of malnutrition and food.**

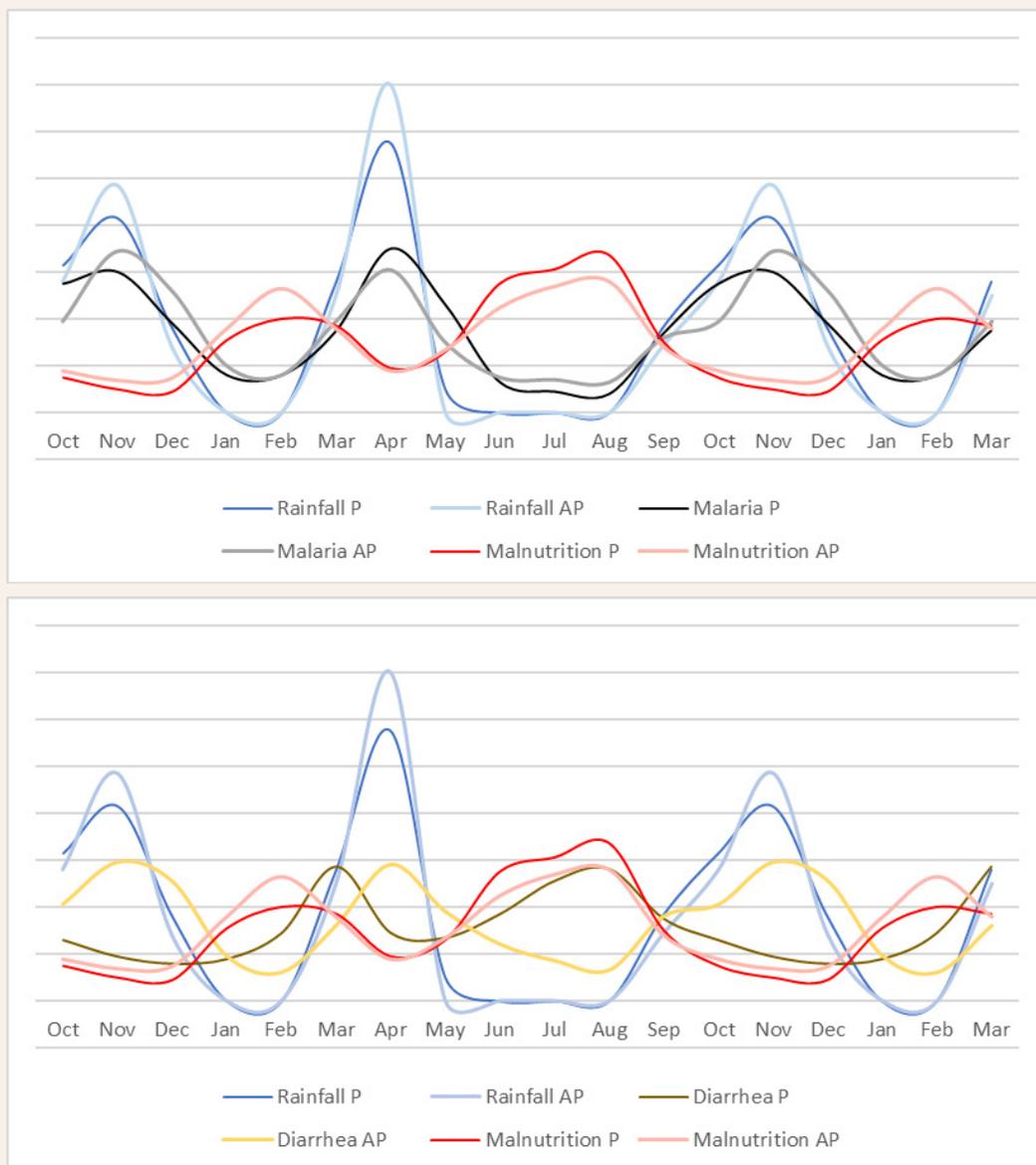


*Notes*  
The diagrams were produced using the same methods as described for Figure 1. However, given that similar monthly patterns for milk availability were observed across all species, these were summarized as averages for ease of presentation.

pastoralist groups purchase more food during the dry season to compensate for the decline in the availability of milk from their own animals, this purchasing of food too does not have much impact on malnutrition from the perspective of the participants (Figure 2).

**Human disease:** Participants identified several diseases that they associated with malnutrition, including malaria, diarrhea, and pneumonia. Both groups identified an increase in malaria during the rainy seasons, which they attributed to an increase in mosquitos during these periods (Figure 3). In the agro-pastoralist areas, participants also reported an increase in diarrhea during both the short and long rains and a corresponding decrease during the short and long dry seasons. Participants explained that during the rainy

**Figure 3. Monthly patterns of malnutrition and disease-related factors.**



*Notes*

The diagrams were produced from the total summated scores for the indicators and months from four independent groups of pastoralists and four independent groups of agro-pastoralists; the data were not summarized using averages. There is no y-axis scale because the number of counters used has no absolute meaning; the lowest level of malnutrition (or any other indicator) shown does not necessarily mean a level of zero. A total of 100 counters was available for each indicator, for distribution across the 12 months. An 18-month timeframe is used on the x-axis to clearly illustrate monthly patterns at the beginning and end of the year.

season, dirt gets into the water sources and children drink “unclean” water from stagnant rainwater pools. They also explained that there is an increase in house flies during this period, which they associated with an increase in diarrhea. Conversely, the pastoralist groups reported peaks in diarrhea at the end of the two dry seasons (Figure 3), which they attributed to deteriorating water quality in the wells and the consumption of purchased foods, specifically ugali (maize meal) and strong tea without milk.

**Women’s work:** For both pastoralist and agro-pastoralist groups, the results showed women’s work increasing during the dry season (Figure 4). These activities include collecting hay for animals, taking animals to distant pasture and water, and collecting water for domestic use. As a result, mothers often leave their children with little or no adult supervision for long periods of time. There may not be anyone at home to prepare proper meals or make sure children observe proper hygienic practices. For example, in one village the women maintained that during this time they prepare porridge for their children before they leave in the morning, and the children will not eat again until they return in the evening.<sup>3</sup> One of the group members described the peak of the dry season as “the months when you forget you have children.”

In another village, participants explained that they frequently spend up to eight hours away from home collecting hay during both the long and short dry seasons.<sup>4</sup> In one community, participants suggested that mothers sometimes tie young children up or lock them in the house to prevent them from harming themselves while they are away.

In the agro-pastoralist communities, activities such as land preparation and harvesting also take place during the dry season. The women did qualify that they are busy throughout the year but that during the dry season these activities are more time consuming. The results show a slight increase in women’s work in November. Participants explained that at this time they collect firewood and wood for construction, and make charcoal to sell so that they have money for the Christmas holidays in December.

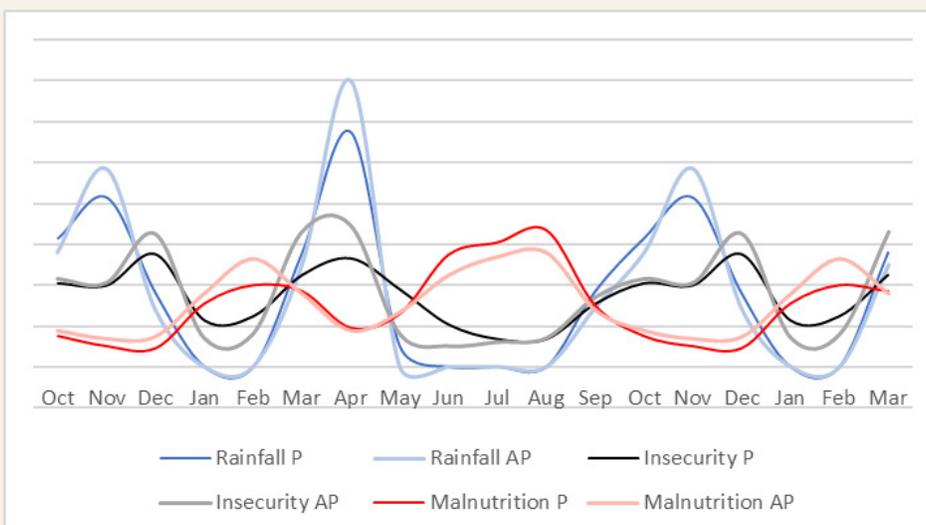
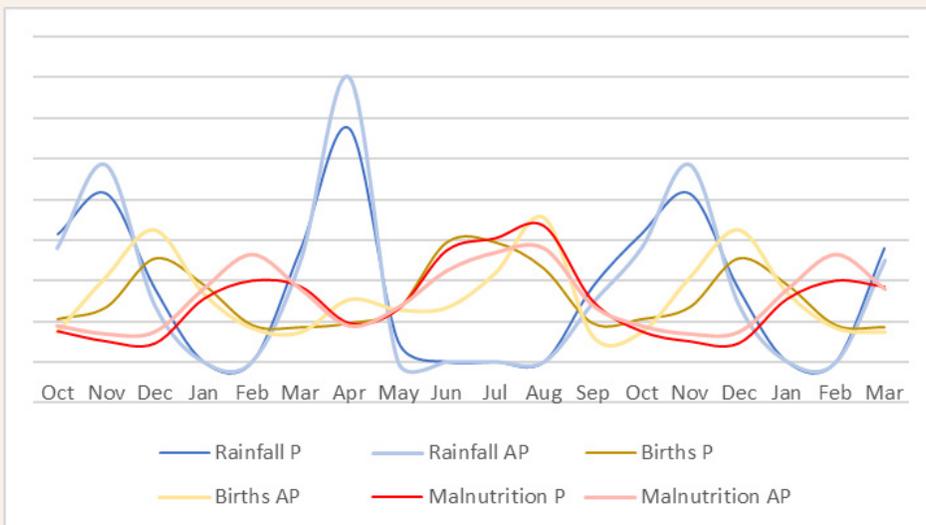
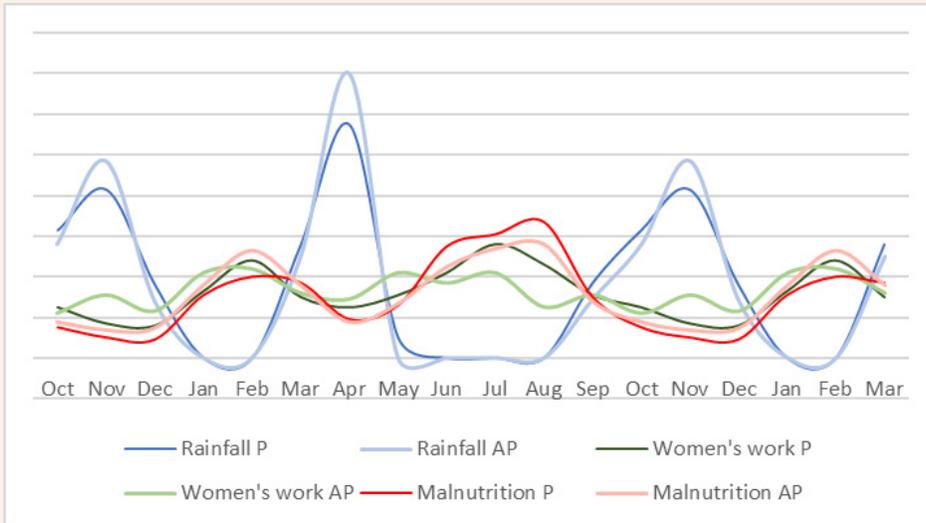
**Human births:** The women indicated that human births occur throughout the year. However, most children are conceived during the short rains from October to December, and women give birth during the long dry season. The women explained that conceptions increase when the men are back from the dry season grazing areas (*fora*), but particularly when this return coincides with the school holidays. When the children are back from school, their parents have more quality time together as the boys relieve the men from taking care of the livestock and the girls help their mothers with domestic chores.

**Insecurity:** The results show that insecurity in the form of livestock raiding increases during or shortly after the two rainy seasons. The women explained that during this period, the animals are healthy and have more commercial value. They also suggested that raiding increases during the school holidays when the boys are looking after the livestock and offer less resistance than the men. They explained that December is a particularly bad month for livestock theft as demand for meat increases during the Christmas holidays and typically the animals are being looked after by boys during this period.

3 Civicon village.

4 Gatab chini village.

**Figure 4. Monthly patterns of malnutrition and other related factors.**



*Notes*  
 The diagrams were produced using the same methods as described for Figure 1. However, given that similar monthly patterns for milk availability were observed across all species, these were summarized as averages for ease of presentation.

## Causes of malnutrition in children and mothers

From the perspective of women from both the pastoralist and agro-pastoralist groups, the main cause of malnutrition in both mothers and children is insufficient milk during the dry season (Figures 3–6).

Lack of income was scored as either the second- or third-most important causal factor for maternal and child malnutrition across both groups (Figures 3–6). Income was mostly associated with people's ability or inability to purchase nutritious food during the dry spells. However, lack of income was often described in the broader context of the limited livelihoods options available to women. For example, participants explained that livestock and land<sup>5</sup> belong to men and the women don't have enough income to purchase these assets. As a result, they are dependent on time- and energy-consuming activities such as charcoal production, which they also associate with malnutrition. In one group, the women explained that access to healthcare was constrained by the lack of income given the high costs of transport to the nearest health center.<sup>6</sup>

Women's work and the associated neglect of children was scored as the second- and third-most important cause of child malnutrition by the agro-pastoralist and pastoralist groups respectively. It was considered the second-most important cause of maternal malnutrition by the pastoralist groups. As discussed, the work burden on women increases during the dry season.

Human disease was identified and scored as an important factor contributing to both child and maternal malnutrition (Figures 5–8). In one of the pastoralist villages, human disease was scored as the second-most important cause of child malnutrition.<sup>7</sup> The women partly attributed this score to the long distances to the nearest health centers, which are in two of the other villages visited.<sup>8</sup>

The non-spacing of pregnancies was identified as an important factor, particularly for maternal malnutrition in agro-pastoralist areas, where overall it was scored as the second-most important cause (Figure 8). In these communities, the women explained that multiple pregnancies weaken the mother but also contribute to child malnutrition as mothers do not have the energy to properly take care of multiple children. They explained that more children mean there is less food in the household. Participants also mentioned that there are cultural taboos around nursing while pregnant. In one village, the women reported that they are aware of family planning but were reluctant to use it.

Other factors associated with children's and mothers' malnutrition included the limited availability of other foods, alcohol abuse, and insecurity leading to livestock losses. Various gender-related issues were also associated with maternal malnutrition, which participants described in terms of stress. These issues were often associated with marital problems, including spousal neglect and domestic violence. In turn, these often related to other underlying issues, including poverty, alcohol abuse, and cultural norms around women's roles and influence over decision making, assets, and income.

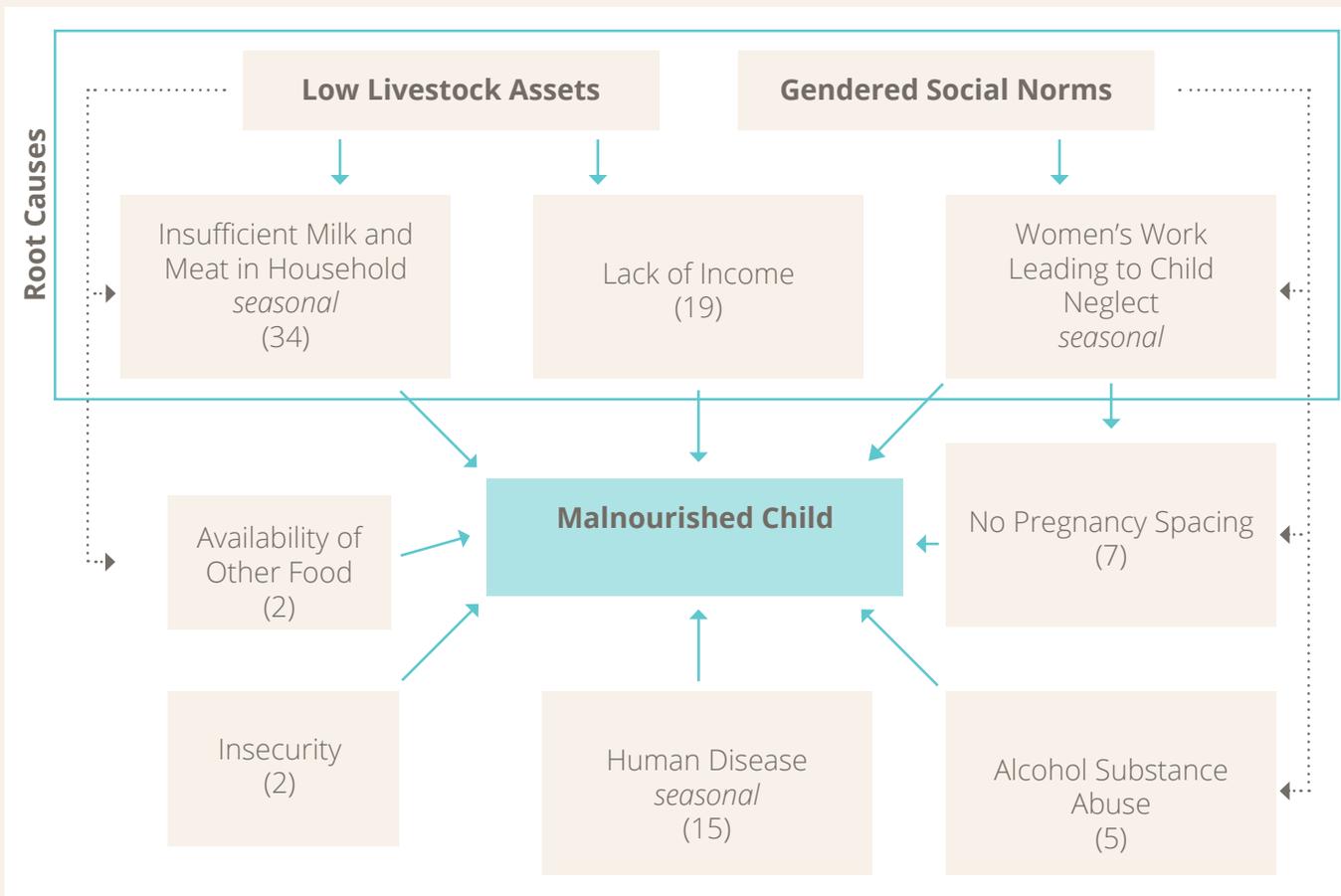
5 Agro-pastoralists only.

6 Civicon village.

7 Civicon village.

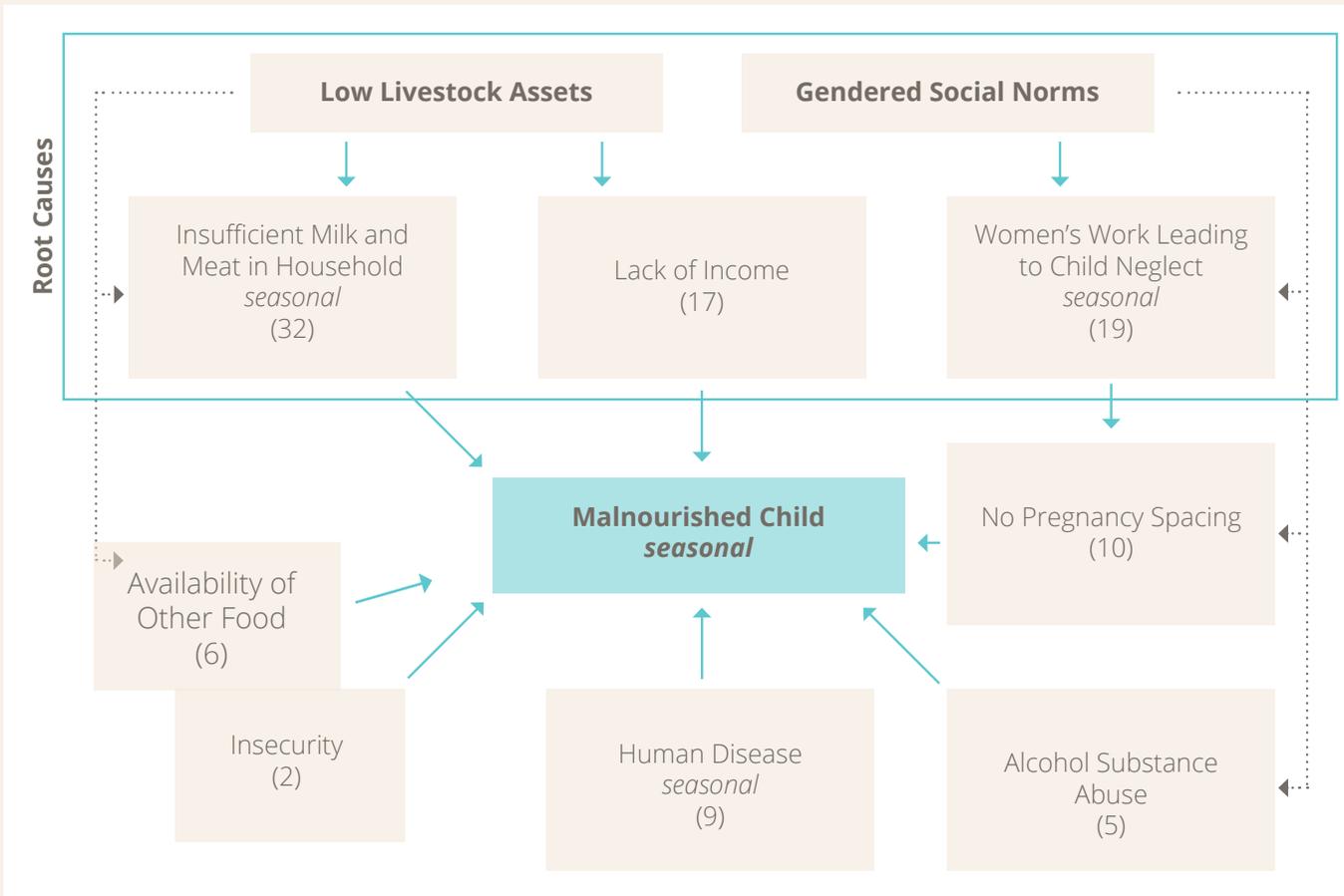
8 Gatab chini and Olturot villages.

**Figure 5. Causes of child malnutrition, pastoralist areas.**



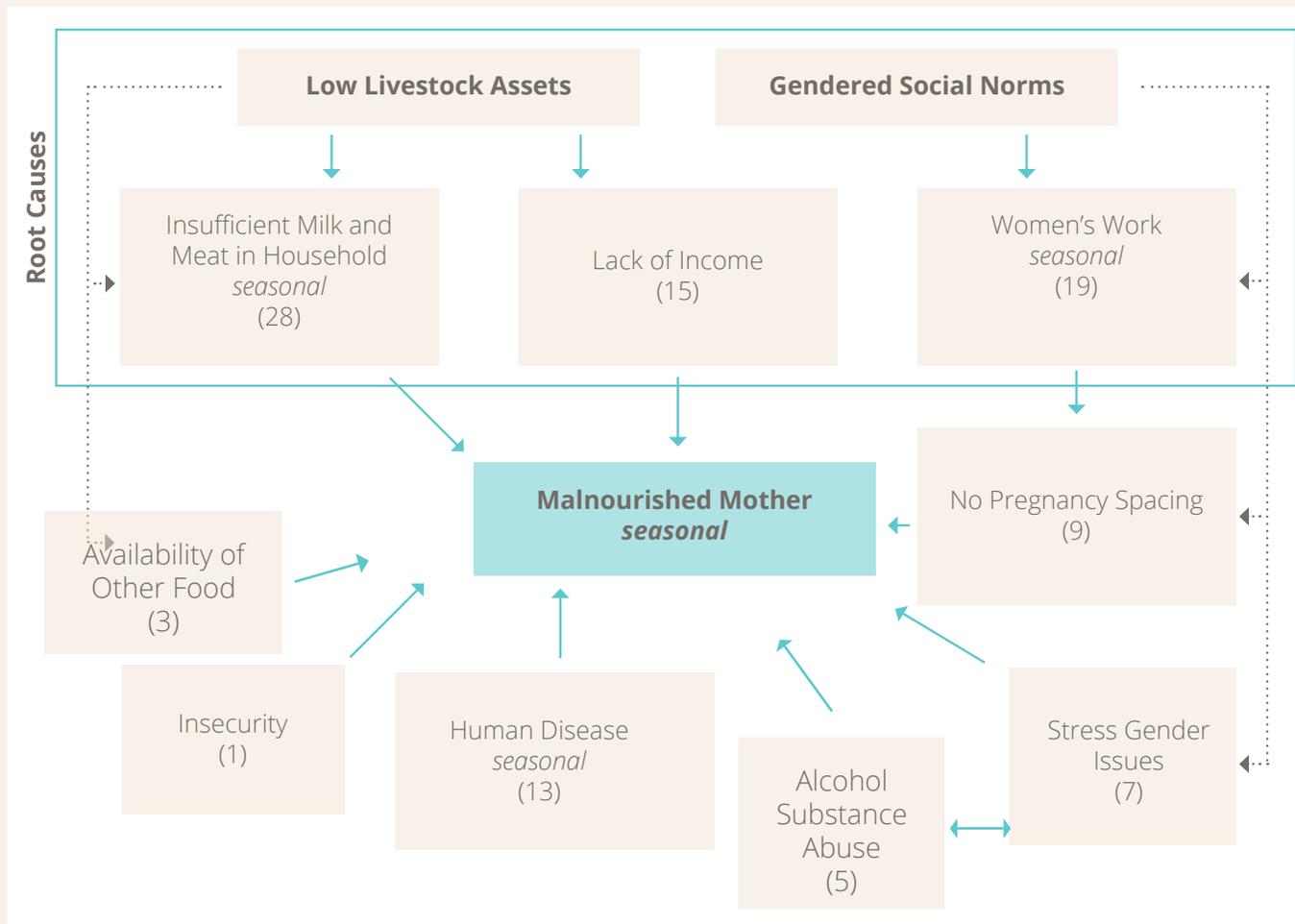
*Notes*  
 Figure derived from interviews with women from pastoralist communities followed by proportional piling of causes with four independent groups of women. The figures in parentheses represent the scores from all the groups presented as a proportion of the total scores.

**Figure 6. Causes of child malnutrition, agro-pastoralist areas.**



*Notes*  
 Figure derived from interviews with women from agro-pastoralist communities followed by proportional piling of causes with four independent groups of women. The numbers in parentheses represent the scores from all the groups presented as a proportion of the total scores

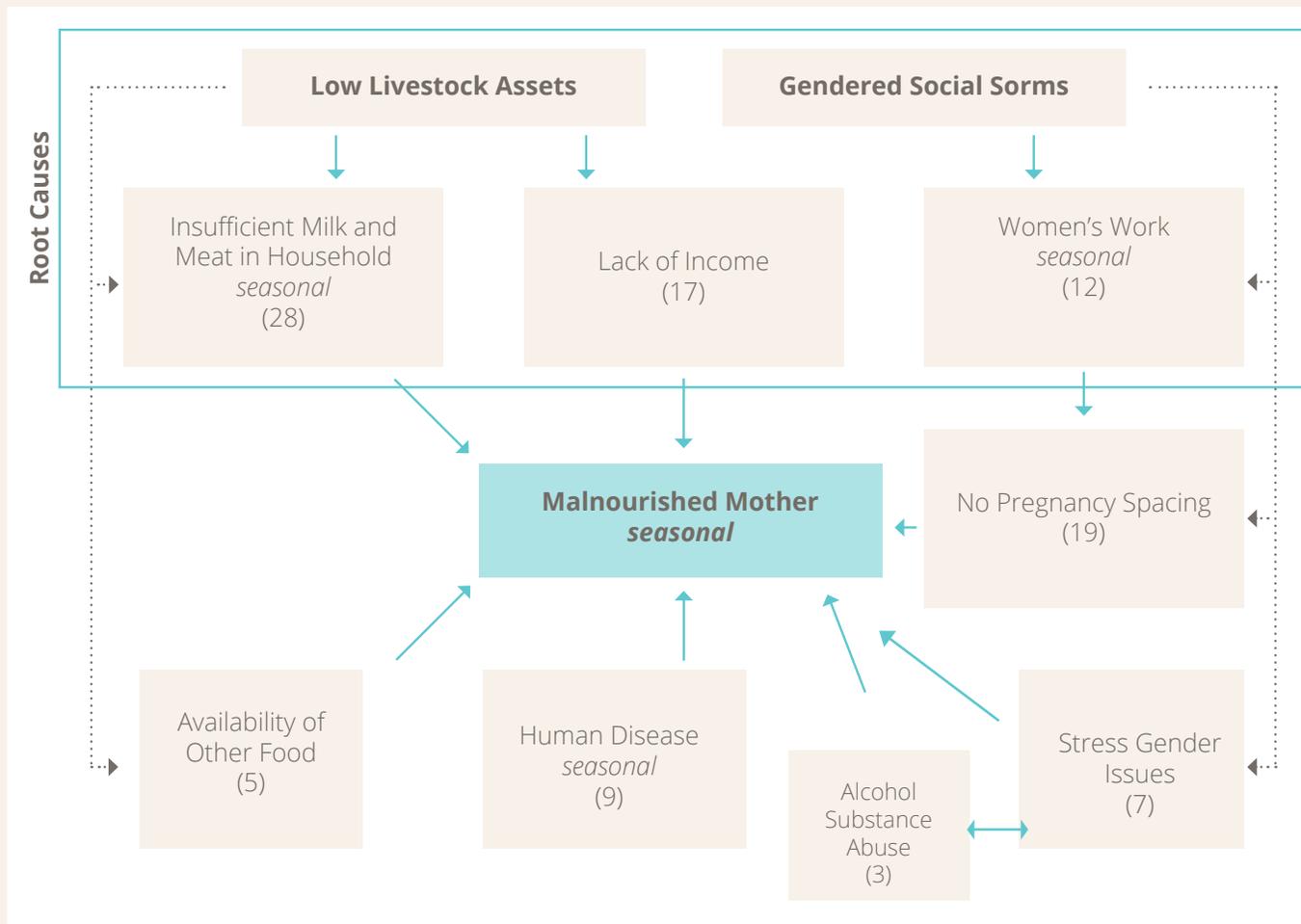
**Figure 7. Causes of malnutrition in mothers, pastoralist areas.**



*Notes*

Figure derived from interviews with women from pastoralist communities followed by proportional piling of causes with four independent groups of women. The figures in parentheses represent the scores from all the groups presented as a proportion of the total scores.

**Figure 8. Causes of malnutrition in mothers, agro-pastoralist areas.**



Notes  
 Figure derived from interviews with women from agro-pastoralist communities followed by proportional piling of causes with four independent groups of women. The figures in parentheses represent the scores from all the groups presented as a proportion of the total scores.

## Conclusions

The results from this case study should be treated with caution given the small sample size. However, they are generally consistent with the results from the other PE assessments in Marsabit and Isiolo. For example, across all areas, the results show malnutrition peaking during the dry season and decreasing during the rains, with the primary reason being the absence of milk from livestock during this period.<sup>9</sup> Similarly, participants identified lack of income as the second-most important cause of malnutrition in the other three PE sites.<sup>10</sup> Participants also identified and provided similar scores for the other causes of malnutrition across all the PE sites. These findings suggest that even across diverse contexts within the two counties, the issues are more or less the same.

Between the pastoralist and agro-pastoralist groups in Mt. Kulal, the results were similar, with a few exceptions. For example, the patterns for milk availability, malnutrition, malaria, and insecurity were almost identical. The patterns for women's work and births were also similar. One interesting exception was the monthly pattern for diarrhea. For the pastoralist groups, diarrhea increases during the dry season and decreases during the rains, which is largely consistent with the results from the other PE assessments. However, in the agro-pastoralist areas, diarrhea increases during the rains. This same pattern was identified in four villages from the PE exercise in Isiolo. Two of these villages in Isiolo were agro-pastoralist and were excluded from the analysis, and two other villages were situated in a flood-prone area along the Ewaso Ngiro River. In all areas, participants associated poor water quality among other factors as a cause of diarrhea, but the seasonality of this factor appears to differ between more- and less-settled communities.

In the agro-pastoralist areas, crops are harvested and consumed during the dry seasons. Although this practice would offset the absence of livestock products during this period, it does not seem to have any noticeable impact on malnutrition. Findings from a PE study carried out in agro-pastoralist areas of Karamoja showed similar results. Despite years of promoting crops in drylands,<sup>11</sup> rates of malnutrition remain high, and, in some areas, stunting is increasing.

There were a few differences in the relative importance of some of the factors associated with malnutrition between the two groups. For example, the pastoralists scored human disease as a more important causal factor than the agro-pastoralists. As discussed, this scoring difference may relate to the access and availability of health services in these more remote villages. On the other hand, the agro-pastoralist groups identified non-spacing of pregnancies as a more important cause, particularly for maternal malnutrition. Interestingly, in the other PE assessments that were carried out in pastoralist areas, participants frequently described seasonal migrations to the dry season grazing areas as a natural form of birth control given that the men are away during these periods. This migration might explain the relative importance of this factor between the two groups.

Although the results from this case study should be viewed as indicative given the small sample size, they are consistent with the findings from more comprehensive PE studies in both pastoralist and agro-pastoralist areas. As such, it would appear that overall, the issues are similar for both communities, even across fairly different contexts.

<sup>9</sup> See Burns et al., 2021a and Mahmoud et al., 2021,

<sup>10</sup> North Horr, Loiangalani (Marsabit) and Merti subcounty (Isiolo).

<sup>11</sup> For example, see Gebremichael and Asfaw, 2019

## References

Burns, J., A. Catley, and H. Mahmoud. (2021 a). Women's knowledge on the seasonality and causes of child malnutrition in Marsabit County, Kenya. United States Agency for International Development (USAID) Nawiri project, Nairobi.

Burns, J., A. Catley, and H. Mahmoud. (2021b). Using participatory epidemiology to investigate the causes and seasonality of acute malnutrition in Marsabit and Isiolo Counties, Northern Kenya: Methods and experiences. Feinstein International Center, Friedman School of Nutrition Science and Policy at Tufts University. Nawiri project.

Catley, A., R. Lotira, and C. Hopkins. (2018). Hidden peaks: Women's knowledge on the seasonality and root causes of child malnutrition in Karamoja, Uganda, and their programming preferences. Karamoja Resilience Support Unit, USAID/Uganda, UK aid, and Irish Aid, Kampala.

Gebremichael, B., and Asfaw, A. (2019). Drivers of food choice among pastoral/agro-pastoral community in Somali Regional State, Eastern Ethiopia. *Advances in Public Health* 2019.

Mahmoud, H., J. Burns, and A. Catley. (2021) Women's knowledge on the seasonality and causes of child malnutrition in Isiolo County, Kenya. USAID Nawiri project, Nairobi.

## Acknowledgments

This publication was produced under the Nawiri project supported by the United States Agency for International Development (USAID) Bureau for Humanitarian Assistance (BHA). The project's goal is to sustainably reduce levels of acute malnutrition among vulnerable populations in Kenya's arid and semi-arid lands (ASALs). The project is being implemented in Isiolo and Marsabit Counties by a consortium led by Catholic Relief Services (CRS), and in Samburu and Turkana Counties by a consortium led by Mercy Corps. This briefing paper was written by Galm Guyo, Hussein Mahmoud, John Burns, and Andy Catley. We would like to acknowledge the contributions of the PE team: Raffaella Adiyakhiso Bulyaar, Chuluqe Abdulai Jarso, Himra Mohamed Intalo, Mary Bilach Huka, Felista Ntesekwa Timaado, Rahma Osman Huka, Joy Sariyon Leparleru, Judy Oreheya, and Muslima Adan Abdi. We would like to thank the county government of Isiolo and Marsabit, key county actors, other local experts, study participants, and key informants at the county, sub-county, and ward levels for willingly participating in this exercise and providing the information required. Special thanks to the Nawiri consortium and staff for their support and contributions. Nawiri would also like to thank USAID BHA for providing funding for this activity.

This publication was possible thanks to the generous support of the people of the United States of America, through the United States Agency for International Development (USAID). The contents are the responsibility of CRS and do not necessarily reflect the views of USAID or the United States Government.

