



Final report

link nca

NUTRITION CAUSAL ANALYSIS

October 2019-February 2020

Agro-pastoral livelihood zone SO 15-16 (Baidoa District)
Riverine livelihood zone SO 13 (Beltweyne District)
Pastoral livelihood zone SO 05 (Goldogob District)
Settlement for Internally Displaced Population SO 19 (Kahda District)
Somalia



Save the Children



Acknowledgements

The Link NCA study covering four livelihood zone across Somalia, namely agro-pastoral livelihood zone SO 15-16 in Baidoa district, Riverine livelihood zone SO 13 in Beltweyne district, Pastoral livelihood zone SO 05 in Goldogob district and a Settlement for Internally displaced population SO 19 in Kahda district, was funded by the UK's Department for International Development (DFID) through Building Resilient Communities for Somalia (BRCiS) Consortium.

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¹ Analysis of Link NCA primary quantitative data sets.

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List of abbreviations

AAH / ACF	Action Against Hunger / Action Contre la Faim
AIMWG	Assessment information Management Working group.
ANC	Antenatal Care
ARI	Acute Respiratory Infections
BRCiS	Building Resilient Communities in Somalia
cGAM	Combined Global Acute malnutrition
CI	Confidence Interval
CMAM	Community Management of Acute Malnutrition
CSB	Corn-Soya Blend
DHS	Demographic and Health Survey
ENA	Emergency Nutrition Assessment
FANTA	Food and Nutrition Technical Assistance
FAO	Food and Agriculture Organization
FEWSNET	Famine Early Warning System
FGD	Focus Group Discussion
FSL	Food Security and Livelihoods
FSNAU	Food Security Nutrition Analysis Unit
GAM	Global Acute Malnutrition
HAZ	Height for Age z-score
HH	Household
HHS	Household Hunger Scale
HDDS	Household Dietary Diversity Score
IDP	Internally Displaced Persons
IPC	Integrated Phase Classification
IYCF	Infant and Young Child Feeding
IYCN	Infant and Young Child Nutrition
LZ	Livelihood Zone
MAHFP	Months of Adequate Household Food Provisioning
MAM	Moderate Acute Malnutrition
MUAC	Mid-Upper Arm Circumference
NCA	Nutrition Causal Analysis
NGO	Non-Governmental Organization
OTP	Outpatient Therapeutic Programme
PNC	Postnatal Care
PPS	Probability Proportionate to Size
rCSI	Reduced Coping Strategy Index
RFS	Risk Factor Survey
RUTF	Ready-to-Use Therapeutic Food
SAM	Severe Acute Malnutrition
SCI	Save The Children
SFP	Supplementary Feeding Programme
SMART	Standardized Monitoring for Assessment in Relief & Transitions
SNS-NCA	Strengthening Nutrition Security –Nutrition Causal Analysis
TBA	Traditional Birth Attendant
UNICEF	United Nations' Children's Fund
USD	United State Dollar
WASH	Water, Sanitation and Hygiene
WFP	World Food Programme
WHO	World Health Organization
WHZ	Weight for Height z-score

Executive Summary

The four districts of Kahda, Goldogob, Beltweyne and Baidoa are among the Building Resilience Communities (BRCiS) project implementation areas. BRCiS, a consortium project funded by DFID, is a nutrition sensitive resilience program aimed at understanding the range of intervention options available to minimize constraints to achieving good nutrition. With the need to understand why under-nutrition rates have plateaued despite past and ongoing interventions, a nutrition causal analysis was designed to help understanding communities' vulnerabilities, hence designing programs that meet community needs. As part of this initiative, BRCiS strives to build the resilience and expand the coping capacities of the most vulnerable populations in selected areas of the country.

Action Against Hunger, as one of the BRCiS partners, sought to undertake the Link NCA study in the above agreed upon districts representing various livelihoods, in order to deepen the understanding on causes of undernutrition and the linkages between nutrition, food security and livelihoods, water, sanitation and hygiene, gender and other thematic areas. The Link NCA included qualitative and quantitative data collection. The key findings drawn from the analysis will inform BRCiS' comprehensive response plan aiming to improve nutritional security across the studied districts and livelihood zones.

Key findings

The analyses undertaken during the Link NCA study identified risk factors believed to impact child acute undernutrition in the respective livelihood zones, specifically, SO 19 Settlement for internally displaced populations, Kahda District; SO05 Pastoral livelihood zone, Goldogob District; SO 15-16 Agro pastoral livelihood zone, Baidoa District; and SO 13 Riverine Livelihood Zone, Beletweyne District.

The result of anthropometric data indicate that acute malnutrition in the SO 19 livelihood zone of Kahda district measured by global acute malnutrition (GAM) was 11.8 % (9.4 - 14.7 95% C.I.), with combined GAM³ at 16.0 % (12.9 - 19.6 95% C.I.) (Cf: Table 19). The proportion of children aged less than 36 months was 65.2% (62.5 - 67.9 95% CI), while children aged less than 24 months were 41.6% (38.9 - 44.4 95% CI). Subsequent analyses revealed children less than 36 months were more likely to be acutely malnourished by MUAC or cGAM than children older than 36 months. The findings also indicated that children less than 24 months were more likely to be acutely malnourished by MUAC or cGAM. Further analysis of mean age of children indicated a mean of 30.1 (29.1 - 31.2) with subsequent analyses taking into account anthropometric measurements of children in the household showing a significant statistical association. This means that children with age above 30.1 (29.1 - 31.2), were less likely to be acutely malnourished by cGAM. The proportion of male children was 51.2 % (47.7 - 54.5 95% C.I.) with subsequent analyses by child sex revealing no significant difference by sex, meaning boys and girls were just as likely to be malnourished.

In the SO 05 livelihood zone of Goldogob district, the prevalence of acute malnutrition measured by global acute malnutrition (GAM) was 16.2 % (13.0 - 20.0 95% C.I.) while the prevalence of combined GAM was 17.4 % (14.3 - 21.1 95% C.I.) (Cf: Table 19). This was the highest prevalence of cGAM recorded in the study zones and is classified as very high by WHO classification⁴ or critical

³ Meaning GAM by WHZ, Oedema, and/or MUAC

⁴ Source: https://www.who.int/nutrition/publications/severemalnutrition/9789241598163_eng.pdf

by IPC classification⁵. The proportion of children aged less than 36 months was 60.6 % (56.4 - 64.7 95% CI), while children aged less than 24 months were 37.4% (30.5- 39.1 95% CI). Subsequent analyses revealed children less than 36 months were more likely to be acutely malnourished by MUAC than children who are 36 months and older. It was also found out that children less than 24 months were more likely to be acutely malnourished by MUAC. Further analysis of mean age of children indicated a mean of 30.4 (29.3- 31.6) months with subsequent analyses taking into account anthropometric measurements of children in the household showing a significant statistical association. This means that children with age above 30.4 (29.3- 31.6) months, were less likely to be acutely malnourished by cGAM. The proportion of male children 6-59 months was 49.7 % (46.5 - 53.0 95% C.I with subsequent analyses taking into account anthropometric measurements of children in the household revealing boys were more likely to be malnourished by WHZ and cGAM than girls.

Acute malnutrition prevalence in the SO 15-16 livelihood zone of Baidoa district measured by global acute malnutrition (GAM) was 8.5 % (6.2 - 11.5 95% C.I.), with a combined GAM at 10.7 % (8.5 - 13.4 95% C.I.) (Cf:Table 19) classified as high by WHO classification⁴ or serious by IPC classification⁵. The proportion of children aged less than 36 months was 61.6 % (57.3 - 65.7 95% C.I.) while those aged less than 24 months were 35.7 % (30.9 - 40.7 95% C.I.). Subsequent analyses revealed that children aged less than 36 months were more likely to be acutely malnourished by MUAC and cGAM and marginally significant by WHZ than children 36 months and older. Subsequent analysis also showed that children less than 24 months were more likely to be acutely malnourished by WHZ, MUAC, or cGAM than children older than 24 months. Further analysis of mean age of children indicated a mean of 31.3 (30.2- 32.4) months with subsequent analyses taking into account anthropometric measurements showing a significant statistical association. This means that children with age above 31.3 (30.2- 32.4) months were less likely to be acutely malnourished by cGAM. The proportion of male children was 50.4 % (46.8 - 54.0 95% CI) with subsequent analyses taking into account anthropometric measurements of children revealing no significant difference in acute malnutrition by sex, meaning boys and girls were just as likely to be malnourished.

The prevalence of acute malnutrition measured by GAM for the SO 13 livelihood zone of riverine Beletweyne district was at 9.2 % (7.0 - 12.0 95% C.I.) with combined GAM at 13.6 % (11.3 - 16.2 95% C.I.) (Cf:Table 19) classified as high by WHO classification⁴ or serious by IPC classification⁵. The proportion of children aged less than 36 months was 61.3 % (56.6 - 65.7 95% C.I.) while those aged less than 24 months were 32.1 % (28.0 - 36.4 95% C.I.). Subsequent analysis indicated that children aged less than 36 months were less likely to be acutely malnourished by WHZ and more likely to be malnourished by MUAC than children 36 months and older. Subsequent analyses also revealed children less than 24 months were more likely to be acutely malnourished by MUAC or cGAM than children older than 24 months. Further analysis of mean age of children indicated a mean age of children at 31.9 (30.9 - 33.0) months with subsequent analyses taking into account anthropometric measurements of children showing a significant statistical association. This means that children with age above 31.9 (30.9 - 33.0) months were less likely to be acutely malnourished by cGAM and more likely to be acutely malnourished by WHZ. The proportion male children were 48.2 % (44.6 - 51.8 95% CI) with subsequent analyses taking into account anthropometric measurements of children revealing no significant association by sex, meaning boys and girls were just as likely to be acutely malnourished.

⁵ Source : <http://www.ipcinfo.org/ipcinfo-website/ipc-overview-and-classification-system/ipc-acute-malnutrition-classification/en/>

Data triangulation from diverse sources⁶ was conducted where risk factors were identified in each livelihood and pathway to child acute malnutrition was developed based on the findings as summarized in respective livelihood zones.

Causal pathway to child undernutrition: SO 19 Settlement for internally displaced populations, Kahda district.

The dominant pathway to wasting in the IDP livelihood of Kahda District (SO 19) likely takes its roots in a limited access to income sources, which translates into a limited access to food, triggering inadequate coping strategies with an effect on a dietary intake of women of reproductive age and children under 5 years of age. While job opportunities in and around settlements for displaced populations are scarce and women are particularly vulnerable to mistreatment, children living in households, which declared livestock as their main source of income, were more likely to be wasted. On the other hand, children whose mothers felt supported by their family and acquaintances, and therefore potentially less stressed and with a lesser workload, were less likely to be acutely malnourished.

As a consequence of household's limited access to income, its access to food is likely to be hindered. However, during the Link NCA quantitative survey, children from households reporting an adequate household food provisioning all year, especially children from households residing in a settlement for more than a year, were more likely to be wasted. This finding being of counter-intuitive nature warrants further research, especially in terms of community engagement during population-based surveys and potential response bias based on predicted programmatic response.

As households perceive food access limitations to meet their daily needs, they are likely to deploy a number of coping strategies, used in a varied sequencing, to overcome a difficult period. According to the Link NCA quantitative survey, children living in households with a higher rCSI score, especially those headed by women, were more likely to be wasted. A similar observation, although without a gender distinction for the head of household, was also noted in the FSNAU datasets. In addition, children were more likely to be wasted if they lived in a household, which consumed cheaper and less preferred foods 3-7 days a week,⁷ and if they lived in a household, which borrowed food 3-7 days a week¹⁰¹. The significant statistical associations for the latter risk factor were particularly observed in female-headed households. Furthermore, children from female-headed households were found to be more vulnerable to acute malnutrition if their households reported reducing meal portions 3-7 days a week¹⁰¹, collected wild foods 3-7 days a week or worked for food 3-7 days a week. Children from all surveyed households, in which meals were reserved only for children 3-7 days a week, were almost 5 times more likely to be acutely malnourished. Considering the severity of the latter coping strategy, it is possible to infer that respective households experience extreme food insecurity, which demands drastic measures to ensure the survival.

Causal pathway to child undernutrition: SO05 Pastoral livelihood zone, Goldgob district

A dominant pathway to wasting in pastoral livelihood zone SO 05 likely takes its roots in a limited access to income sources, which translates into a limited access to food, triggering inadequate coping strategies with an effect on a dietary intake of women of reproductive age and children under 5 years of age. Children living in households, which waged labour or petty trade as their main source of income, were potentially more likely to be wasted (p-value <0.1). Children from

⁶ Secondary data, quantitative data, scientific literature, Seasonal and historical association, Qualitative data and Community rating exercise.

⁷ During a 7-day recall period prior to the data collection.

households reporting difficulties with an adequate household food provisioning, especially children from households residing in the area for more than a year, were more likely to be wasted.

A complementary pathway to wasting in SO 05 livelihood zone potentially leads through the water, sanitation and hygiene sector, although the available evidence is scarcer than in the case of SO 19 livelihood zone. While children living in households, which demonstrated an adequate handwashing behaviour, were potentially less likely to be wasted, children living in households using an improved water point were more likely to be wasted. The counter-intuitiveness of this finding might be linked with a high cost of water, which the household might be unable to cover, and/or an unstable access to this water point caused by repairs or maintenance, during which a household looks for other, mostly unprotected water sources, to cover its daily needs.

Children's vulnerability to diseases demonstrated significant statistical links with acute malnutrition as children suffering from diarrhoea or fever and diarrhoea were more likely to be wasted. Children suffering from cough were marginally more likely to be wasted (p-value <0.1) while their chances of cough increased in households with a poor hygiene. Based on the community feedback describing their dwelling uninhabitable during the hot season due to high temperatures it would be interesting to study this potential relationship further.

Causal pathway to child undernutrition: SO 15-16 Agro pastoral livelihood zone, Baidoa district

A dominant pathway to wasting in SO 15-16 livelihood zone imitates previously discussed pathways, although the available evidence is less consistent than was observed in SO 19 and SO 05 livelihood zones. It also likely takes its roots in a limited access to income sources, which translates into a limited access to food, triggering inadequate coping strategies with an effect on a dietary intake of women of reproductive age and children under 5 years of age. Children living in households, which declared agriculture as their main source of income, were marginally more likely to be wasted (p-value <0.1), likely due to recurrent droughts with a rippled effect on the agricultural production. Children from households, which reported a more stable access to food (MAHFP), especially children from households residing in the area for more than a year, were less likely to be wasted and, therefore, an adequate access to food can be categorised as a protective factor against acute malnutrition in the studied area.

However, as households perceive food access limitations to meet their daily needs, they are likely to deploy a number of coping strategies, used in a varied sequencing, to overcome a difficult period. According to the Link NCA quantitative survey, children living in households with a higher rCSI score, especially those headed by women, were potentially more likely to be wasted (p-value <0.1). A similar observation, although without a gender distinction for the head of household, was also noted in the FSNAU datasets, while the statistical significance was stronger (p-value <0.05). In addition, children were more likely to be wasted if they lived in a household, which borrowed food 3-7 days a week¹⁰¹ or collected wild foods 3-7 days a week. Children were also more likely to be wasted if they lived in households, which reserved meals only for children 3-7 days a week¹⁰¹. Children living in households which reduced meal portions 3-7 days a week or purchased food on credit 3-7 days a week were potentially more likely to be wasted (p-value <0.1).

In case an adequate food access is possible, an increase in dietary diversity score (IDDS) suggested an increase in child's WHZ, while children with an acceptable IDDS score had lower odds of wasting. In contrast, the analyses based on the FSNAU datasets seem to suggest that a consumption of iron rich foods during a 7-day recall period prior to the data collection increase child's chances of wasting. The counter-intuitiveness of this finding warrants further research but

is possibly related to limitations of dietary recall assessments' ability to differentiate frequency from quantity.

A complementary pathway to wasting in SO 15-16 livelihood zone potentially leads through the water, sanitation and hygiene sector. Children living in households living in close proximity to water points (less than 500 m or 15 min walking) were potentially less likely to be wasted (p-value <0.1), meaning proximity to a safe water source likely positively affects adequate hygiene practices. Children living in households, which demonstrated an adequate handwashing behaviour, were less likely to be wasted. On the other hand, children living in households with soil floors were more likely to be wasted.

Children's vulnerability to diseases demonstrated significant statistical links with acute malnutrition in the Link NCA quantitative survey, as children suffering from diarrhoea were more likely to be wasted. In addition, children suffering from measles and pneumonia were more likely to be wasted according to the FSNAU datasets.

Causal pathway to child undernutrition: SO 13 Riverine Livelihood Zone, Beletweyne district

A dominant pathway to wasting in SO 13 livelihood zone imitates previously discussed pathways and likely takes its roots in a limited access to income sources, which translates into a limited access to food, triggering inadequate coping strategies with an effect on a dietary intake of women of reproductive age and children under 5 years of age. Children living in households, which declared agriculture and waged labour/petty trade as their main sources of income, were potentially less likely to be wasted (p-value <0.1), suggesting a protective effect of income on a nutritional status of children.

An interesting relationship was observed in relation to the perception of external support, meaning that children of mothers who perceived little external support were more likely to be wasted, while children in female-headed households receiving sufficient level of external support were less likely to be wasted.

Limited access to income hinders household food access. However, during the Link NCA quantitative survey, children from households reporting an adequate household food provisioning year-round, especially children from households residing in a settlement for more than a year, were more likely to be wasted by WHZ, but were less likely to be wasted by MUAC. This counter-intuitive finding warrants further research, especially regarding community engagement during population-based surveys and potential response bias based on predicted programmatic response.

As households perceive food access limitations to meet their daily needs, they are likely to deploy a number of coping strategies, used in a varied sequencing, to overcome a difficult period. According to the Link NCA quantitative survey, children living in households with a higher rCSI score were more likely to be wasted. In addition, children were more likely to be wasted if they lived in a household, which consumed cheaper and less preferred foods 3-7 days a week or in which meals were reserved only for children 3-7 days a week. The latter risk factor is considered the most severe coping strategy, implying that households, which experience extreme food insecurity, have adverse effects on nutritional status of the mother and child. In contrast, higher MUAC values of mothers were linked with an increase of both WHZ and MUAC values of children. Comparable findings were also recorded for the FSNAU datasets.

In case an adequate food access is possible, an increase in dietary diversity score (IDDS) suggested an increase in child's WHZ. In contrast, the analyses based on the FSNAU datasets seem to suggest that a consumption of iron rich foods during a 24-hour period, as well as a 7-day recall period,

prior to the data collection increase child's chances of wasting. The counter-intuitiveness of this finding warrants further research but is possibly related to limitations of dietary recall assessments' ability to differentiate frequency from quantity.

Only one risk factor in the water, sanitation and hygiene sector demonstrated a significant statistical association with wasting in this livelihood zone. In fact, the available data suggests that an increase in household hygiene reflects in the increase of child's WHZ, meaning that adequate hygiene practices at a household level have a protective effect against wasting. Yet children's vulnerability to diseases demonstrated significant statistical links with acute malnutrition as children suffering from diarrhoea, fever or cough, were more likely to be wasted. In addition, children suffering from measles were more likely to be wasted according to the FSNAU datasets.

Key Recommendations

Based on these findings, the following activities, per livelihood zone are thus recommended to be considered for an incorporation into current/future interventions.

Global Recommendations

- Invest in early warning early action give population's alerts on possible risks to their livelihood to reduce the impact income sources and enhance community and household resilience.
- Investment on transformative capacities and governance at livelihood level in management of rangelands and water management points through improvement in access to water through construction of new and/or maintenance of existing water points using existing structures and mechanisms to ensure their proper long-term utilization by investing in water management systems involving communities.
- Enhance, technical trainings to population to ensure their skills match market demand as way to increase employment opportunities for household members thus increasing household income.
- Government and partners to invest in building adaptive and absorptive capacities through investments projects such as agriculture and livestock, business enterprises etc.
- Investing in ecosystem management: Rangeland, and water systems in respective communities.
- Encourage market-based programming focusing on value chain approach from production to market access.
- Minimize child exposure to disease pathogens by improving on household hygiene practices to include childcare practices, such as child cleaning, ensuring safe child-playing environments.
- Enhancing adequate water access by household to facilitate tagine practices

SO 19 livelihood Zone of Kahda district

- Government and partners encourage diversification of income sources by creation of income generation activities, providing technical training skills that match the job market to increase population chances of being engaged in meaningful income generating activities.
- Designing programs to cushion household against impact of high sea tide when there is reduced casual labour activities leading to household loss of income.
- Enhancing household water access by repairing non- functional water points and reduce walking distance and long queues.
- Ensuring gaining child playing environment at household as well as providing young children with mats to crawl on to avoid contamination as they crawl on unhygienic environments.
- Ensuring improved mothers nutritional status, by providing mothers with alternative livelihoods and reducing workload, which will in turn reduce child malnutrition.

- Designing of health facility opening hours to fit the working schedule of the IDPs mothers. This will facilitate access to health care during child illness.

SO 19 livelihood zone of Goldogob district

- Ensuring access to healthcare by introduce more health facilities and more consistent outreach services to provide health services for the people living hard to reach area.
- To improve the low resilience, there is need for environmental conservation/reforestation and range management, Livestock restocking as well as create small-scale business for pastoral dropouts. This will in turn increase household income and reduce coping mechanism.
- Increase household access to clean water sources to reduce water related diseases such as diarrhea as well as improve household hygiene practices.
- Cushion household against food access challenges, more so the Pastoral dropout –IDP s
- Design livestock restocking programs to the most affected households to improve their incomes and food access
- Reduce child exposure to disease by encouraging hygienic child playing environment.

SO 15-16 livelihood zone of Baidoa district

- Investment in small and large-scale agricultural production investment, to include Livestock restocking and diversification of Income sources to include Formal/informal education and vocational trainings to have skills matching the market demand.
- Reduce reliance on rain fed agriculture, which is affected by cyclic droughts hence reducing household access to income and food.
- Enhance or improve access to healthcare by households away from Baidoa by establishing outreach centers or new health facilities
- Designing household hygiene and sanitation promotion programs to reduce hygiene related illnesses.
- Establish a market driven farming to ensure farm produce gets markets as well as addressing the production and market access bottlenecks in the district.

SO-13 livelihood zone of Beletweyne district

- Ensuring household adequate access to clean water through establishing new water sources (shallow wells) to protect/limit the impacts of river flooding as well as reestablishing broken water systems due to flooding or any other factors.
- Investment in shallow water infrastructure multi-use system to reduce on time wastage queuing and also improve on water hygiene.
- Increase utilization of health facilities by households through establishing new health facilities or outreach centers.
- Ensuring household hygiene is enhanced to reduce exposure of disease pathogens to children through dirty environment.

1.0. Introduction

The Link NCA study targeted four livelihood zones (LZ's) within diverse districts, namely: settlements for internally displaced population SO 19 in Kahda district of Mogadishu, Pastoral livelihood zone SO 05 in Goldogob district, Agro-pastoral livelihood zone SO 15-16 in Baidoa district and Riverine livelihood zone SO 13 in Beletweyne District. Special attention was given to different profiles of vulnerability to undernutrition based on communities' livelihoods specialisation. [Figure 1](#) shows the distribution of study areas across Somalia, namely Kahda ('Kaxda'), Goldogob, Baidoa ('Baydhaba'), and Beletweyne (Beletweyne) districts in Bay, Benadir, Hiran and Mudug regions.

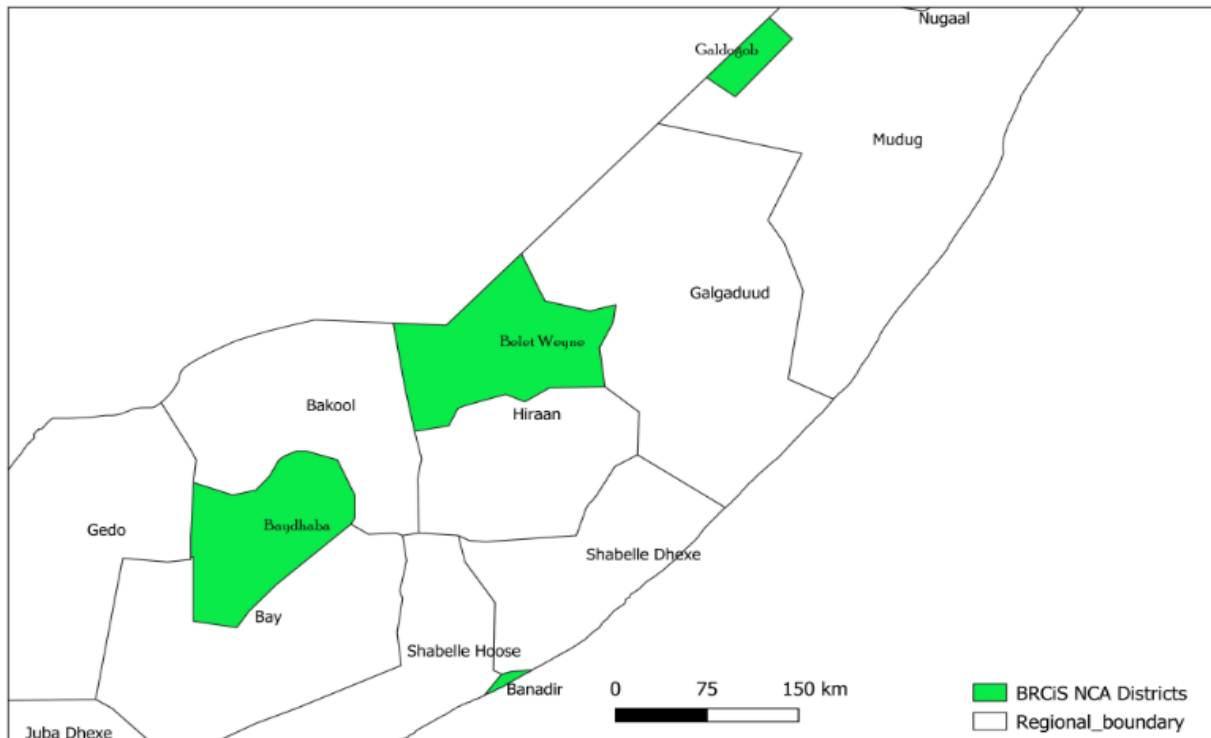
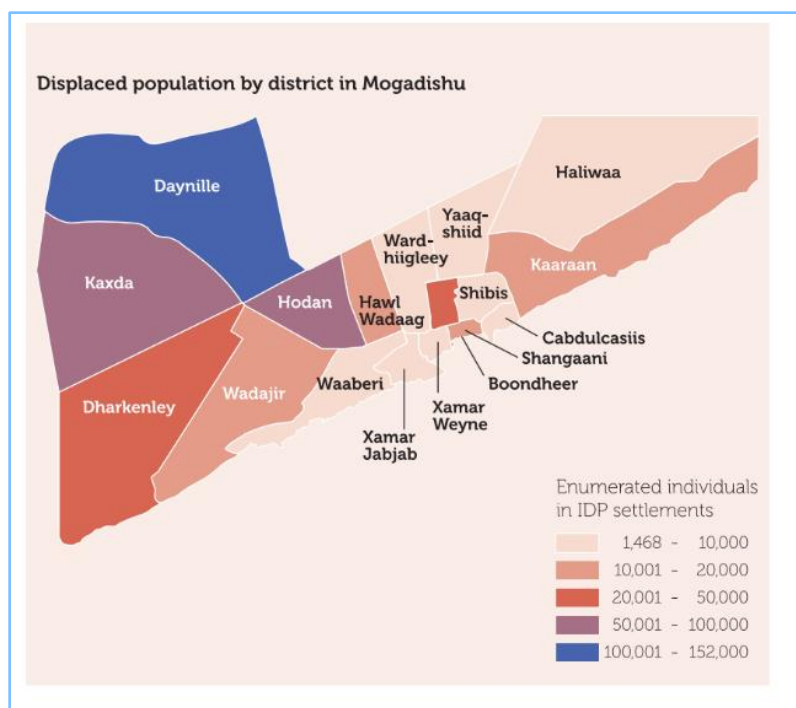


Figure 1: BRCiS Implementation areas

1.1. SO 19 Livelihood zone for internally displaced persons, Kahda district Mogadishu



Mogadishu hosts the largest estimated protracted, internally displaced persons (IDP) population in Somalia, living mainly in informal settlements across the city as shown in (Cf: Figure 2⁸) with continued immigration from other parts of the country, while others are forced to move from within the city to its outskirts. Majority of population in Kahda (or 'Kaxda') are IDPs and host community members.⁹

Ongoing armed conflict and insecurity, as well as cyclical climatic shocks, compounded by political and socioeconomic factors, continue to drive the humanitarian crisis in Somalia. Such factors have resulted in

Figure 2: Map of Displaced Population in Mogadishu District including Kahda ('Kaxda') protracted economic vulnerability and the loss of livelihoods. Violence and limited access to humanitarian assistance and basic social services in rural and hard-to-reach areas has spurred mass population movement toward urban and peri-urban areas, further straining the limited resources and absorption capacity. The combined impact increasingly exposes households to risks of violence, exploitation and abuse.

According to the Humanitarian Need Overview 2019¹⁰, the four main reasons for internal displacement are conflict or fear of conflict (33%), drought (22%), a lack of livelihood opportunities (16%), and evictions (5%).

IDPs residing in privately-run settlements are faced with recurrent evictions. According to Human Rights Watch¹¹, the evictions in Kahda are particularly brutal and the majority of the IDPs were said to face secondary displacements. In addition, as most IDPs sites are controlled by gatekeepers (individuals or groups connected to landowners, government officials, or militia leaders) who exploit the IDPs through demand of 'rent,' a portion of the aid that IDPs receive.

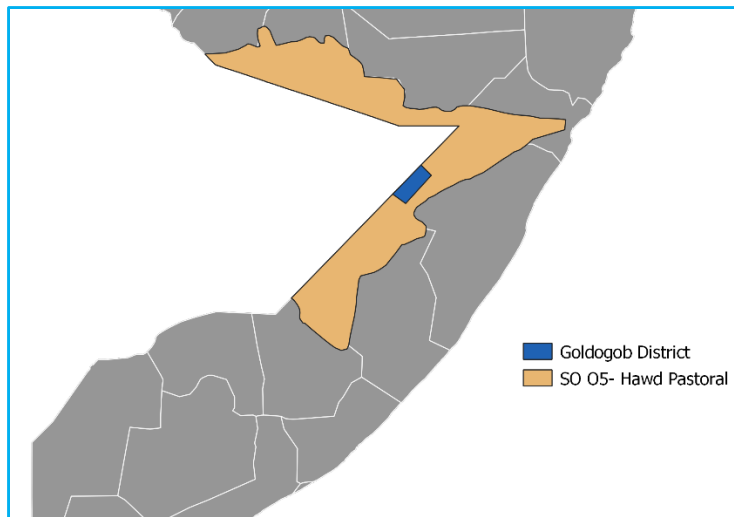
⁸ Source: <https://www.jips.org/uploads/2018/10/JIPS-Somalia-Mogadishu-profile.pdf>

⁹ Internal displacement profiling, Mogadishu, April 2016.

¹⁰ Source : <https://reliefweb.int/report/somalia/2019-somalia-humanitarian-needs-overview>

¹¹ Source : <https://www.hrw.org/news/2015/04/20/somalia-forced-evictions-displaced-people>

1.2. SO 05 Pastoral livelihood zone, Goldogob district



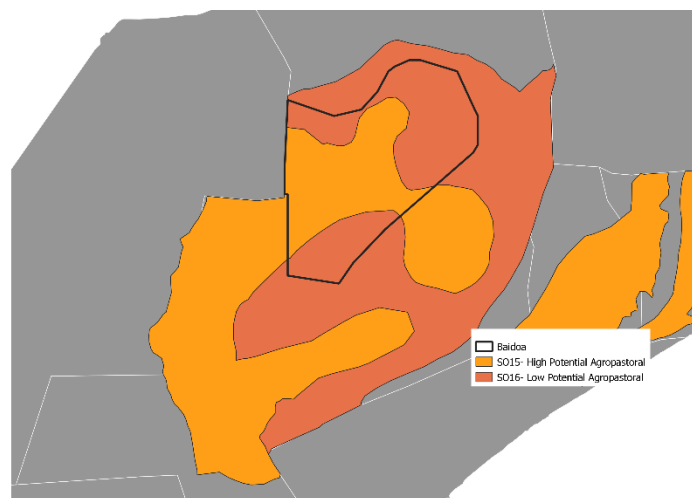
Goldogob district (Cf: [Figure 3](#)¹²) is located in north-central Mudug region, Puntland state of Somalia. The district is situated in Hawd Pastoral Livelihood Zone. It borders Ethiopia to the west. It is semi-arid, with altitudes of between 800 and 1200 meters above sea level, and forms a vast plateau that is the prime grazing and browsing area, with patches of flat lowland covered with extensive bush and shrubs.

The main livelihood activity of the population in Goldogob is livestock keeping (80%)¹³. The majority of

Figure 3: Hawd Pastoral Livelihood Zone (Goldogob district)

households are dependent on livestock sales to purchase cereals and other commodities. The urban population rely on small businesses, waged/casual labour and formal employment and remittances from household members working in other areas of Somalia as well as abroad. There is a large population of IDPs and urban activities in Goldogob town and Bursalah. with pastoralists representing more than 80% of the population in the District.¹⁴

1.3. SO 15-16 Agro-Pastoral livelihood zone Baidoa District



Baidoa or “Baydhaba,” as it is locally known, is located in Bay region. The District has two main livelihoods is categorized as high and low potential agro pastoral zones as shown in [Figure 4](#).¹² A strategic economic hub, it is considered the seat of agro-pastoralism in Somalia given its reputation for high potential sorghum production, relative farming in the area, as well as livestock production. Over the past few years, there has been a steady influx of IDPs into Baidoa town from within and outside the region. The town is swelling with large number of IDP camps.

Figure 4: High and low potential agropastoral Livelihood zone (Baidoa district)

The high potential agro-pastoral livelihood zone has more reliable rains and fertile soils combine to make this Somalia’s ‘Sorghum Basket’. Rain-fed production is the norm here and sorghum is the main cereal crop with only small amounts of maize grown. Cowpeas are an important pulse, grown mainly for home consumption but also as a cash crop. The low potential agro-pastoral livelihood zone consists of open shrub

¹² FSNAU, FEWSNET, 2016, Somalia livelihood profile.

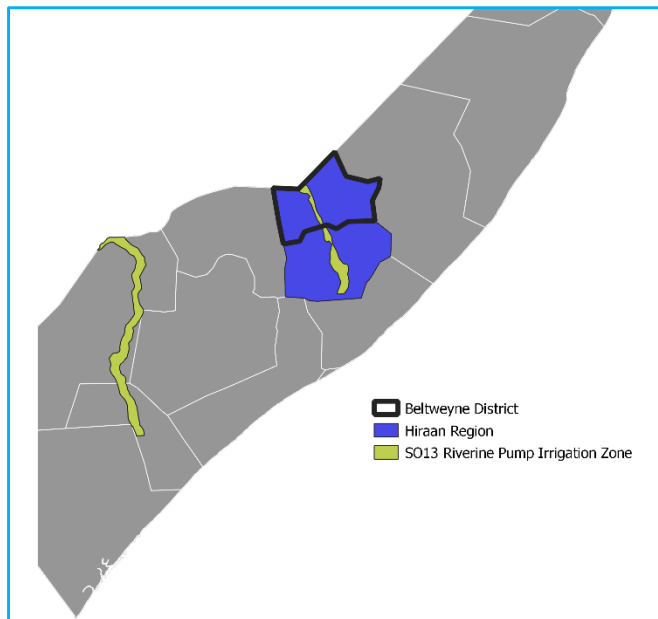
¹³ Source: Somalia Livelihood Profiles, June 2016

¹⁴ UNFPA, 2014 population estimates

land, which is ideal for livestock grazing. Grazing areas are communal and shared peacefully in years of adequate rainfall; however, during times of drought, conflict over scarce pasture resources often breaks out. There is sufficient water supply for both human and animal consumption, and water is free; however, during the dry seasons, household's pay for water, especially by middle and better off households.

Although people live in settled communities, there is a regular pattern of seasonal migration with livestock being taken to pasture-rich areas in the wet seasons. Men and older boys take camels off to graze further away, while cattle and sheep/goats tend to remain behind.

1.4. SO 13 Riverine livelihood zone, Beltweyne District



Beltweyne is a city in south-central Somalia. Located in the Beltweyne District, it is the capital of the Hiraan region. The town is situated in the Shebelle Valley near the Ogaden region of Ethiopia, some 206 miles (332 km) north of Mogadishu. Beltweyne is divided by the Shebelle River into eastern and western sections (Cf: Figure 5).

This agricultural zone covers the two narrow riverine areas along the upper Juba and the upper Shebelle Rivers¹³. The zone covers a corridor of land stretching around 5-8 kilometers out from either side of the rivers where pump irrigation is widely practiced together with some rain-fed cultivation. A mix of food and cash cropping is carried out where maize and sorghum are the staple food crops, while mangoes are the main cash crop.

Figure 5: Pump irrigation zones (in Beltweyne District)

The District is slightly dominated by the *Makanne*, *Reer-shabeelle* and *Eeylo* communities considered as minority clans elsewhere in Somalia. 'Qoraxsin' (sunset) settlement, which lies to the west of the town, is home to by two larger clans – *Jebeles* and *Galjecel*. The east side of the town is more developed and houses notable government offices, social amenities including the airport and the general hospital, numerous universities and other learning institutions, big business premises and the major markets, and offices for humanitarian actors.

There are also large IDPs communities in the District, who were previously agro-pastoralists and riverine farmers, and are now dependent on casual labour, petty trading, and humanitarian assistance. Security and inter-clan fighting are the root causes of their displacement.

2.0. Study Justification

Building Resilient Communities in Somalia (BRCiS) is a consortium implementing nutrition sensitive resilience programming through funding from DFID aimed at enhancing the community capacities to cope up with shocks. In order to address chronic vulnerabilities in the District and have effective and targeted programming, nutrition causal analysis methodology was identified to identify and highlight various community vulnerabilities. The information collected will be utilized to in developing programs aimed at building community capacities of the targeted communities through evidence-based innovations programming.

The underlying theory of change for building resilient communities in Somalia (BRCiS) places a strong focus on strengthening linkages between humanitarian and development assistance with the community in the center. The objective is to strengthen linkages between communities and stakeholders that belong to their greater ecosystem, connecting marginalized and vulnerable groups to larger networks. In the past four years, resilience programs including BRCiS have demonstrated an added value to helping to meet humanitarian needs while addressing some of the underlying problems that contribute to the recurrent food crisis and undernutrition.

In order to design a high-impact, sustainable and replicable project design to reduce acute malnutrition, a formative research to better understand the context-specific causes of acute malnutrition and determinants of related behaviours was designed. This formative research was intended to build a solid evidence base for future interventions adapted to an in-depth understanding of the context and community priorities.

The Link NCA study is a critical part of this approach, allowing a better understanding of the underlying causes of acute malnutrition and the linkages between nutrition, food security and livelihoods, water, sanitation and hygiene, gender and other thematic areas. The key findings drawn from the analysis will inform the design of the project, supported by awareness raising and advocacy efforts, in order to develop an integrated optimal response aimed at reducing rates of acute malnutrition in the study areas.

2.1. Study Objectives

Global objective

The main objective of this Link NCA study is to identify the major risk factors and causal pathways leading to undernutrition in the study districts.

Specific objectives

The Link NCA aimed to answer the following study questions:

- To determine and compare the prevalence of undernutrition in four different livelihood zones,
- To understand historical and seasonal trends of wasting and its determinants for the identified livelihood zones,
- To identify major under-nutrition pathways and associated risk factors with the description of local mechanisms that lead to under-nutrition and their interconnections,
- For each major causal pathway, identify the most vulnerable household and children,
- For each risks factor, identify positive deviants and study their enabling/ resilience strategies,
- To define local community perceptions on risks factors, shocks, resilience's capacities and recommendations to address the risks,
- Identify barriers and levers associated with resilience capacities,

- To determine risk factors and pathways to undernutrition among marginalized groups within livelihoods,
- To determine the relevance of BRCiS Theory of change (TOC) with the NCA findings,
- Adapt BRCiS activities according to the study results and together with stakeholders develop actionable multisector recommendations aimed at improving resilience programming.

3.0. Methodology

Nutrition Causal Analysis (Link NCA) is a method for analyzing the multi-causality of undernutrition, 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.¹⁵

The methodology has been precisely defined and tested in the field with a guidance available for every step of the method. It offers a unique opportunity for a great variety of key informants, from technical experts to community members, to express their opinions on the causes of undernutrition in the zone of study. The findings are constantly reviewed until validated by all stakeholders. The Link NCA places value on perceived causes as well as on evidence-based causes to display the complexity of perspectives. Undernutrition is examined globally, avoiding a vertical, sectoral approach, linking different verified sources of information to build consensus around the plausible causes of undernutrition in a given context.

3.1. Key Stages

Preparatory phase (January to June 2019)

The main objective of a preparatory phase was to define key parameters of the study, including its objectives, geographical coverage and feasibility. A preliminary secondary data and literature review was conducted in order to define the structure of the study. Considering new methodological advancements¹⁶ and a lack of availability certain key indicators for the zone of study, an option comprising all three Link NCA study components¹⁷ was selected. This phase also included preparation and planning stages necessary for any type of study, i.e. a development of Terms of Reference, resource mobilization as well as a recruitment of a Link NCA Analyst.

Identification of hypothesized risk factors and causal pathways (July to August 2019)

The key responsibility of a Link NCA Analyst at this stage was to gather an overall understanding of a local context and to identify a set of risk factors and their interactions, which could potentially trigger undernutrition among the target population in the zone of study. The identification of hypothesized risk factors and causal pathways was based on a systematic literature review (using the Link NCA Pathways to Undernutrition module and all grey¹⁸ literature available locally), supported by a series of exploratory interviews with key informants, such as representatives of relevant governmental institutions, non-governmental organizations and/or academia with an in-depth knowledge or work experience in the zone of study. The identified hypothesized risk factors

¹⁵ For more information about the methodology, please refer to www.linknca.org.

¹⁶ Integration of statistical associations' calculations (prevalence of wasting/stunting in relation to identified risk factors) with an aim to enrich the data analysis/triangulation for a more precise definition of local causal pathways.

¹⁷ Qualitative Inquiry, Risk Factor Survey and Anthropometric Data Collection.

¹⁸ Annual, research and technical project reports, working papers, evaluations, policies, etc. produced by government agencies, non-governmental organizations, academia or private companies/consultants.

were presented, examined and validated for field testing during the Initial Technical Workshop¹⁹ (Cf: [Table 6](#)).

Primary data collection: Qualitative inquiry (September 2019 - February 2020)

The qualitative data collection, lasted from 16th September to 5th December 2019 for Kahda, Goldogob and Baidoa districts, while Beltweyne District was delayed until February 2020 as a result of floods (Cf: [Table 1](#)). It comprised of an in-depth inquiry on all risk factors identified and validated in preceding stages through semi-structured interviews and focus groups discussions as two principal data collection methods. The collected data was recorded in writing in the form of notes and later reproduced electronically.

Primary data collection: Quantitative Risk Factor survey (October 2019 - February 2020)

The quantitative data collection, which comprised of an Anthropometric data collection and a Risk Factor Survey conducted by the Link NCA Analyst with support from technical program officers from BRCiS lead organizations from respective districts, took place from 5th October 2019 to 10th February 2020 (Cf: [Table 1](#)). There was again a delay in data collection in Beltweyne District due to flooding. The questionnaires were deployed on mobile devices and the collected data was uploaded into ONA Platform²⁰.

Synthesis of results and building a technical consensus (August 2020)

Upon the completion of a data collection stage, the Link NCA Analyst synthesized all collected data sets and conducted a series of analyses in order to categorize risk factors according to their relative impact on acute malnutrition in the four livelihood zone under study and to describe dynamic relationships between various risk factors and their effects on undernutrition. The categorization of risk factors took into account all sources of information collected in the course of study. The Final Technical Workshop, planned for August 2020, is indefinitely postponed due to the CoVID-19 pandemic and consultation with technical teams on how best to conduct the workshop. Consequently, an alternative, remote validation and review process was planned with the Nutrition Cluster in Mogadishu, which shared the report and presentations to other clusters i.e. Food Security Cluster among others. The findings were also shared for input from BRCiS Technical Working Group as well as the Assessment and Information Management (AIM) working group.

Communication of results and response planning (August 2020)

The results of the Link NCA were presented to the operational and decision-makers at the national level via a series of conference calls organized with the help of a virtual meeting platform. The planned calls will be covering a variety of key stakeholders, including the Government of Somalia ministries,²¹ members of the BRCiS Consortium, and other partners. The final task will be developing a response plan based on the Link NCA findings with the objective to improve nutrition security interventions in the study zone.

¹⁹ Participants included technical experts covering a variety of sectors, such as health and nutrition, maternal health and care practices, agriculture, food security and livelihoods, water, hygiene and sanitation, and education.

²⁰ Mobile data collection platform (<https://ona.io>)

²¹ The lead government department is the ministry of health whose docket the Nutrition Causal analysis sits under the Nutrition information(AIMWG) ,

4.0. Primary data collection

The quantitative data collection, which comprised of an anthropometric data collection and a risk factor survey, and qualitative data collection took place on various dates as shown in (Cf: Table 1).

Table 1: Technical validation of hypothesised risk factors and primary data collection

District	Date of technical Workshop	Number of attendees	Quantitative data collection dates	Qualitative data collection dates
SO 19 LZ Kahda district	3 rd and 4 th July 2019	19	05 th to 11 th October 2019	16 th September to 9 th October 2019
SO 05 LZ Goldogob district	7 th and 8 th July 2019	20	19 th to 26 th October 2019	17 th September to 12 th October 2019
SO 15-16 LZ Baidoa district	27 th and 28 th October 2019	14	25 th Nov to 1 st December 2019	18 th November to 5 th Dec 2019
SO 13 LZ Beltweyne district	29 th and 30 th January 2020	16	10 th to 15 th February 2020	6 th to 25 th February 2020.

4.1. Quantitative data collection

4.1.1. Sample size

The sample size for the Link NCA Anthropometric and risk factor data collection was calculated at District level using ENA for SMART software (2011 version) with various variables used to compute the sample size as shown in (Cf: Table 2)

Table 2 Sample size determination table-quantitative

District	% < 5 yrs.	Estimated GAM	Mean HH Size	Precision	Design effect	Non-response rate	Sample size children	Sample size HH	# clusters	# HH/ cluster
SO 19 LZ Kahda district	20 % ²²	16.3% ²³	6 ²⁴	4.3	1.8	3% ¹⁰	555	530	41	13
SO 05 LZ Goldogob district	20 % ⁷	20.2%	6 ⁹	4.5	1.7	3% ¹⁰	556	540	42	13
SO 15-16 LZ Baidoa district	20 % ⁷	14.3%	6 ⁹	4.0	1.7	3% ¹⁰	545	520	35	15
SO 13 LZ Beltweyne district	20% ⁷	15.9%	6 ⁹	4.2	1.7	3% ¹⁰	539	504	42	12

Sampling procedure

The sample size for the Link NCA quantitative (Anthropometric and Risk Factor Survey) was calculated following the SMART methodology²⁵ where a two-stage cluster sampling design was used to sample the survey clusters/study villages. The sampling frame for the 1st stage sampling was an updated list of villages in each of the survey areas. The list of villages with their updated

²² FSNAU Post Deyr Nutrition Assessment 2017/2018

²³ SMART survey Mogadishu IDPs, Benadir region, March 2018

²⁴ <https://somalia.unfpa.org/sites/default/files/pub-pdf/Population-Estimation-Survey-of-Somalia-PESS-2013-2014.pdf>

²⁵ Source: <https://smartmethodology.org/>

populations²⁶ was entered into ENA for SMART software 9 July 2015 version, and clusters were randomly selected using probability proportional to size (PPS) (Cf: [Annex 1](#)).

At stage 2, the survey adopted simple random sampling to select the households to be interviewed from the sampled clusters, where mobilization among the selected clusters was conducted to ensure smooth data collection process. During data collection, teams were provided with updated household lists of households in all the selected clusters with the help of the local guides/village elders, where the number of households per cluster were selected (Cf: [Table 2](#)). In selected households, anthropometric measurements were performed on all eligible children (aged 6-59 months)²⁷ and the household questionnaire administered to caregivers of the children. Empty households and households with absent children were re-visited and information of the outcome recorded on the cluster control form.

4.1.2. Team composition and training

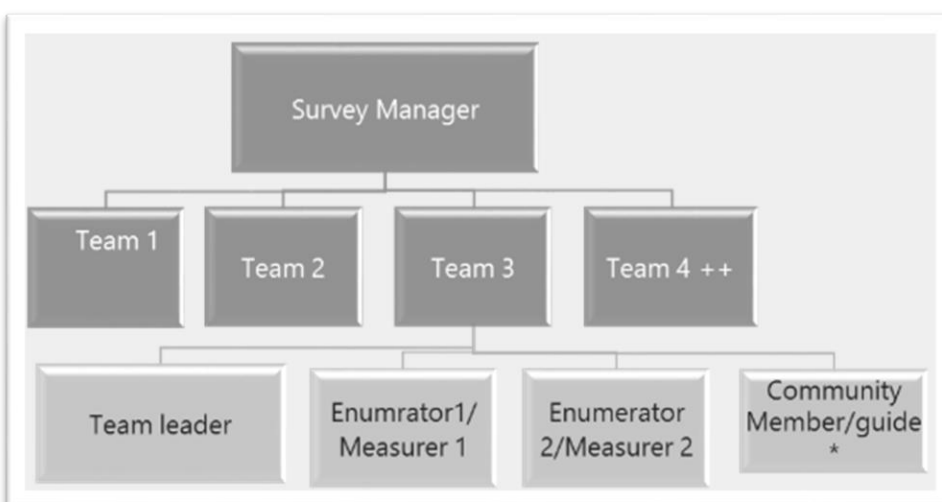


Figure 6: Link NCA Quantitative Risk Factor survey team Structure

in each sampled cluster to facilitate team's community entry and to ensure community acceptance. Prior to the commencement of data collection, all team members received a thorough five-day training took place in respective districts.²⁸ The training included, among other objectives, modules on survey methodology, anthropometric measurements using the SMART methodology, and administration of household risk factor questionnaires using mobile devices. All team members participated in a standardization test of anthropometric measurements and a pilot test for quality assurance purposes.

4.1.3. Data collection tools

The quantitative data was collected via an electronic questionnaire downloaded onto mobile devices. The questionnaire covered all areas of interest as per the validated hypothesized risk factors. It was composed of sub-sections pertaining household demographics, a caregiver of a child under 5 years of age. Other sections were dedicated to observations of caregiver care practices or household hygiene and sanitation practices. During the training, there was a rigorous

The quantitative survey team composed of 4 - 6 teams of two enumerators, one survey leader and one community guide or mobilizers as shown in (Cf: [Figure 6](#)). Each team leader was responsible for methodology compliance and quality assurance. A guide was hired

²⁶ Somalia MOH/WHO polio data

²⁷ Height, weight, MUAC and Oedema

²⁸ Training was conducted in 25th, to 30th September 2019 for Kahda, Goldogob was conducted on 14th to 18th October 2019 and Baidoa 19th to 23rd November 2019 while Beltweyne 4th to 9th February 2020.

translation and back translation of the questions to from English to Somali language. This was to harmonize and standardize the way enumerators asked questions at household level.

In addition, for all children aged 6 – 59 months, anthropometric measurements, such as height/length, weight, mid-upper arm circumference (MUAC) and a presence of oedema, were recorded, as per the SMART methodology guidelines. The height/length was measured using standard height boards, whereas weight was measured using digital scales borrowed Ministry of Health and FSNAU and other partners within the operation areas. MUAC was measured using three-colored standardized tapes and readings recorded to the nearest 0.1cm. Oedema was diagnosed by applying a moderate finger pressure on the top of child’s the feet. The child was recorded as edematous only if both feet clearly had oedema.

4.1.4. Quantitative data collection challenges

- Accuracy in terms of child's age: Due to a low availability of recorded birth dates in all the districts under study, the data collection team had to determine an approximate age of a child using a local events calendar developed, which could potentially affect the accuracy of age determination. This jeopardizes the accuracy of age -related indicators i.e. stunting and underweight.
- Team competencies & supervision: While the majority of enumerators had experiences in conducting SMART related assignments majorly across the districts, there were some enumerators who were new to SMART methodology. They were, however, blended with the experienced enumerators during the team composition.
- Lack of access to data collection sites by the Lead NCA Analyst: General insecurity might have led to poorer supervision of the data collection process and quality assurance, and thus certain data discrepancies. This was however mitigated by having team leaders who had experience in SMART data collection and supervisors from hosting organization and the Ministry of Health.
- Participant bias: Due to a long history of humanitarian assistance, participants in sampled communities might have perceived some benefit in participating in the survey and the validity of their responses could be questioned. This potential threat was mitigated through an active engagement with community leaders, local guides, and a systematic provision of detailed information about the study to all participants prior to their interview.

4.2. Qualitative data collection

4.2.1. Sampling framework

The study areas (villages), were identified and discussed amongst various stakeholders based on the NCA methodology, where three villages deemed pockets of malnutrition and community unit considered having low burden malnutrition were selected factoring various vulnerabilities as shown in (Cf: [Table 3](#)).

Table 3: Sampled qualitative study areas-(villages) and justification

District	Selected village(s)	Population profile	Justification for the selection
SO 15-16 Baidoa district	Kormari IDPs camp	Occupied mainly by agro-pastoral households who were displaced from the rural farming areas by droughts and insecurity	Majority of population depends on agricultural labor, some of the HHs are transitioning into urban livelihoods affected by lack of skills and network.

		The camp is also occupied by returnees from Mogadishu IDPs and refugee camps in Kenya.	There is low access to essential services.
	Wadajir	More recently established settlements within Baidoa, mainly occupied by host community that are dependent on urban livelihoods.	Identified as a location with low vulnerability, and has a mix of livelihoods including urban and agro-pastoral. Relatively well served by health facilities and schools, with the main referral hospital and a number of Maternal Neonatal Child health (MNCH) facilities located within the settlement. The settlement has now attracted a number of IDPs settlements, mainly agro-pastoral dropouts.
	Makuda	Agro-pastoral areas with limited services and relatively insecure environment. Dependent mainly on crop and livestock production, with maize and sorghum being the main crops and sheep and goats and camels being kept. Poor households also dependent on agricultural labor and collection and supply of firewood and charcoal to Baidoa town.	Purely agro-pastoral villages to the South of Baidoa town. Situated outside Baidoa about 7 kilometers to the south, The area is fairly insecure, HHs in the villages have low access to outreach services and in essential services such as water, healthcare and education – it has no MCH, schools.
	Bonkay	HHs, who are mainly dependent on agricultural production, labor and livestock, the village has benefitted from humanitarian interventions such as restocking and agricultural inputs. Nevertheless, as in other rural villages access to services and facilities such as education, healthcare, education and markets are limited	Located in higher productive areas, and traditionally, these HHs used to have carry over cereals stocks from previous season, but due to consecutive low seasons, they have depleted their surplus stock and HHs were more dependent on market purchases
SO 13 Beltweyne district	Bacadbuke	Riverine minority community Situated about 14 KMs west of Beltweyne District headquarters.	The inhabitants are mainly from non-dominant clan, engaged in farming. The village is secure and accessible for humanitarian organizations. However, the village has relatively high levels of malnutrition.
	Bacad	Riverine host community Situated about 19 KMs east of Beltweyne town.	It is a typical agro-pastoral community where crop and livestock production is integrated. It is mainly settled by the dominant clan, is fairly accessible to NGOs and had moderate levels of malnutrition.
	Jawil	Situated about 28 KMs east of Beltweyne. Relatively bigger village on the main transit route to northern Somalia region. The direct road between the village and Beltweyne is rough paved road and occasionally insecure.	It is mainly pastoral, though rain-fed farming is practised seasonally. It is secure, accessible to NGOs, occupied by a dominant clan with significant investments from the diaspora. As a result, the levels of malnutrition are lower.
	Domey	IDPs settlement town situated South of Beltweyne town – about 5 KMs	Mainly occupied by displaced riverine community that is dependent on casual labour opportunities.

SO 05 Goldogob district	Goldogob	Urban host community with IDPs	Urban livelihoods with high population of IDPs, and have better access to facilities
	Xero Jale	Host community – urban livelihoods	Inhabited by minority groups who are mainly dependent on casual labour
	Darussalam	Pastoral – linked with cross border trade	Cross border community that are dependent on pastoral and cross border trade
	Qansahle	Pastoral livelihoods	Pastoral livelihoods with limited access to facilities
SO 19 Kahda district	Liqliqato	Host community and new IDPs who were evicted from other parts of Mogadishu or have arrived from other regions of Somalia	There are different settlements (including IDPs and host community) within the District. The study team targeted settlements within the District with particular focus given to areas with newly arrived IDPs and IDPs evicted from their settlements within Kahda as well as eviction from other parts of Mogadishu.
	Abadir	Host community The oldest IDPs camp	
	Omar Fiyasko	Host community, especially from minority clans, pastoral dropouts and IDPs evictees,	
	Shimbiralle	Host community IDPs who have been evicted from the other areas of within Kahda.	

4.2.2. Team composition and training

The qualitative data collection was conducted by a team of local researchers speaking local dialects and with an easy access to otherwise hardly accessible communities. The selection of this team was based on lessons learnt from a previous nutrition causal analysis conducted in 2015,²⁹ the main hindrance of which was community access.

Identification of community mobilisers was based on community members who were well known at the study area. They were locally identified to support the qualitative investigators select study participants for focus group and Key informants' discussion and carry out any support functions, as needed by the interviewers.

4.2.3. Data collection methods and tools

The qualitative study collected information from a wide range of topical issues, from various community groups and using key informants (KIIs) and focus group discussions (FGDs) employing a number of qualitative tools to elicit more information and to guide the process of data collection as summarized in (Cf: Table 4). Interview guides for the FGDs and KIIs were developed and were pre-tested.

Table 4: Qualitative data collection methods and participants

Key study/thematic areas	Qualitative study participants	Qualitative tools used
<ul style="list-style-type: none"> ▪ Health, nutrition and malnutrition; ▪ Breastfeeding and complementary feeding; ▪ Marriage, pregnancy and child spacing; ▪ Agricultural production and incomes; ▪ Food security and livelihoods; ▪ Market access, use of resources and coping strategies; 	<ul style="list-style-type: none"> ▪ Community leaders (village leaders, religious leaders and other prominent community persons); ▪ Traditional healers or birth attendants; ▪ Health center personnel (doctors, nurses, health extension workers); ▪ Representatives of community-based organizations; 	<ul style="list-style-type: none"> ▪ Historical calendar ▪ Community ranking of risk factors ▪ Seasonal calendar ▪ Gender analysis tools including gender boxes, gender activity profile and gender access and control profile ▪ Storytelling

²⁹ 2015, SNS Consortium, Nutrition causal analysis, South Central Somalia.

<ul style="list-style-type: none"> ▪ Land access, migration, and community solidarity and food aid; ▪ Women and men workload and social status; and ▪ Community belief and sensitization activities. 	<ul style="list-style-type: none"> ▪ Mothers and fathers of children under 5 years of age (both malnourished and well nourished); ▪ Grandparents of children under 5 years of age ▪ Key government staff and staff of consortium partners ▪ Gate Keepers at the IDP sites. 	<ul style="list-style-type: none"> ▪ Meal composition chart ▪ Household expenses ▪ Health journey / Therapeutic itinerary
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The qualitative data collection team managed to collect data from the following key groups as shown in (Cf: [Table 5](#)).

Table 5: Summary of community consultations during the Link NCA qualitative inquiry

	Village	No. FGDs	No. KIIs	No. observations	No. community restitutions	No. participants	% Female participants	No. days spent
Baidoa	Kormari	12	5	4	1	150	80%	6
	Wadajir	12	5	3	1	143	76.2%	6
	Makuda	12	5	3	1	154	80.5%	5
	Bonkai	12	5	3	1	146	78.1%	4
Beltweyne	Domey	12	6	4	1	145	65.5%	5
	Bacaadbuke	12	5	3	1	143	65.7%	5
	Bacaad	12	4	4	1	143	62.9%	5
	Jawil	12	5	4	1	132	67.4%	5
Goldogob	Alaale	12	5	3	1	148	74.3%	7
	Qansahle	12	5	3	1	146	78.7%	5
	Dar Salaam	12	5	4	1	150	79.3%	6
	Xero Jale	12	5	3	1	151	77.5%	6
Kahda	Liqliqato	12	5	4	1	150	80%	8
	Abadir	12	5	3	1	143	76.2%	5
	Omar fiasco	12	5	3	1	154	80.5%	5
	Shimbiralle	12	5	3	1	146	78.1%	5

4.2.4. Qualitative data collection challenges

The study data collection was implemented as planned, nevertheless, it faced several challenges. While some challenges are district specific, others cut across in the districts.

- Limited ease of movement due to insecurity: Mogadishu limited the ease of movements; most of the roads in the city were barricaded and many security checks mounted along the few accessible routes, with movement restricted after 1600 hours. As a result, the team was forced to end data collection by 1500 hours, which limited the time spent in the field conducting KIIs and FGDs. The team, however, ensured thorough mobilization and setting time schedule with the community, which ensured no time was wasted waiting for participants. In Beltweyne and Baidoa, working outside Beltweyne town posed some risk associated to kidnapping by Al-Shabaab, particularly if working for a humanitarian organization. This was however addressed by strictly following the respective organization security guidelines.
- Disruption of field data collection schedules: In Kahda, data collection was disrupted for two days as a result of an IED explosion as well as road closures during the Somalia Partnership Forum held on 1st and 2nd October 2019 in Mogadishu. The data collection period was thus extended in this village.

- Long distances to selected villages and poor road infrastructure: In Goldogob, the distance between villages and combined with the poor road network, with the risk of landmines increased the time taken during travel. Clan rivalries and revenge attacks were common on the roads linking the villages, especially in Xero Jale. As a result, the Link NCA team had to delay morning trips and hasten the ending of afternoon sessions; nevertheless, the team worked in the pre-agreed study villages ensuring that representation was achieved, and the study quality not compromised.

4.3. Data management and analysis

The quantitative data was collected via an electronic questionnaire downloaded onto mobile devices and regularly uploaded onto an online ONA²⁰ platform. Before and after each upload, the data was scanned for logical errors. After a final compilation, all the data was exported in the form of an Excel spreadsheet and analyzed with Excel and STATA Software. The anthropometric data was analyzed using ENA for SMART software (2011 version).

The qualitative data was recorded manually in a notebook and reproduced electronically at the end of each data collection period in a sampled community. The data was grouped by themes for a more efficient analysis, making sure that a confidentiality of speakers is guaranteed. All views were then analyzed using qualitative content analysis methods.

4.4. Ethical considerations

The following provisions were respected during the course of the Link NCA study:

- All relevant authorities, were duly informed about the study by Action Against Hunger and from planning, validation, data collection and ultimately validation of survey findings;
- The participants were selected equitably and their informed consent was sought to ensure that they participate in the study voluntarily;
- The participants of a qualitative survey were able to participate in more than one focus group discussion, if they chose but due to their commitments community leaders were advised to spread the selection of participants across the whole village or a cluster of villages, if needed;
- The community leaders were informed of the selection of their community for the purpose of a qualitative study at least two days in advance. During the initial meeting they received a detailed planning of research activities in order to facilitate the participant selection process and ensure the participants' availability at stated times. The detailed planning was subject to change, if required by community members. The qualitative data collection team accommodated to their routine as much as possible, taking into account time constraints of the study;
- The anonymity of participants was ensured during all stages of the study (data collection, data analysis and data storage). Their names were not collected nor shared;
- The qualitative data collection team organized a community wrap-up discussion during the last day of the data collection in order to allow communities to review their findings, rank identified risk factors and prioritized actions for the way forward;
- All children aged 6 – 59 months who were identified as suffering from severe acute malnutrition and/or other medical condition were referred to the nearest health facility for appropriate treatment.

4.5. Study limitations

- Data representativeness and extrapolation of findings: The quantitative sampling framework for each District were limited to selected livelihood zones of interest and are therefore not representative of the whole District. As a consequence, the study findings are relevant for stated livelihood zones in respective districts, where the study was conducted, and cannot be extrapolated to the entire District and/or similar livelihood zones in other districts without proper verification of relevant risk factors and causal mechanisms in respective areas.
- Season-specific data: The anthropometric measurements and other season sensitive risk factors do not in any way reflect the current situation in the study areas, which might have changed since the data collection period.
- Risk factor prevalence estimates: Risk factor prevalence estimates featured in this report were calculated from a complete data set, where certain entries might have been doubled or tripled for caregivers and/or households with more than one child under 5 years of age. For this reason, they cannot be deemed statistically representative of all households and/or caregivers in the district.
- Correlations: It is advised to appraise statistical associations with caution as observed links do not necessarily prove the causality, while unobserved links do not mean that the causality does not exist. Correlations thus must be considered within a larger framework, triangulated with other sources of data, and as such can be used for a prioritization of current and future interventions.
- Heterogeneity: While certain heterogeneity differences were observed and are rightfully highlighted in the findings, certain information might have been omitted or distorted, depending on participants' knowledge.

5.0. Nutrition Causal Analysis (NCA) Findings

5.0.1. Hypothesized risk factors

The identification of hypothesized risk factors was based on a systematic literature review (using the Link NCA Pathways to Undernutrition module and all grey literature available locally), supported by a series of exploratory interviews with key informants, such as representatives of relevant governmental institutions, various cluster³⁰ representatives, and non-governmental organizations implementing programs in respective districts. The identified hypothesized risk factors were presented, examined and validated for field testing during the initial technical workshops (Cf: [Table 1](#): Technical validation of hypothesised risk factors and primary data collection).

Technical experts were afterwards invited to categorize risk factors according to their contribution to undernutrition in the zone of study on a scale from 1 (risk factor expected to contribute marginally to undernutrition) to 5 (risk factor expected to contribute substantially to undernutrition). N/A represents risk factors, which were not validated in a respective District as their contribution in that context was not deemed important. The results of this exercise are presented in the (Cf: [Table 6](#)).

Table 6: Hypothesised risk factors validated during initial technical workshop

	Risk Factor	Technical Rating by stakeholders ³¹			
		Kahda	Goldogob	Baidoa	Beltweyne
A	Low Access to healthcare and utilization of traditional healthcare	3.2	3.6	3.1	4.8
B	Low use of health services	3.4	3.8	4.0	5
C	Low birth spacing and unwanted pregnancies	1.1	2.2	3.5	1.8
D	Low Birth weight (LBW)	N/A	N/A	N/A	N/A
E	Care givers stress	N/A	N/A	3.3	N/A
F	Non-optimal breast-feeding practices	2.4	2.4	4.0	3.2
G	Non-Optimal Infant and Young Child feeding practices	2.9	3.0	2.9	2.0
H	Low quality of interactions between the child and the caregiver	1.6	2.4	2.6	N/A
I	Low access to food	3.1	3.4	4.5	2.4
J	Low household access and availability of income sources	3.8	3.3	3.5	3.4
K	Market malfunction or supply system	2.7	2.6	3.8	3.4
L	Low resilience	3.4	3.0	3.3	2.6
M	Low access and availability of water (quality and quantity)	3.5	3.7	3.7	3.0
N	Poor hygiene practices	3.6	2.9	3	4.2
O	Low sanitation practices	3.2	3.1	3.2	3.6
P	Women's work overload	2.7	2.9	3.6	2.4
Q	Low social support for women or households	3.3	3.2	2.8	N/A
R	Low nutritional status of women	1.6	1.9	3.4	2.6
S	Migration and Eviction	N/A	1.5	N/A	N/A
T	Insecurity/Protection and Marginalization	2.7	3.0		3.1
U	Women Low level of education among women/relative power decision	N/A	2.7	3.8	N/A
Key (explaining color codes)		³²	N/A ³³		³⁴

³⁰ Health, Nutrition, Water Sanitation and Hygiene, Food Security and Livelihoods and protection and shelter Clusters.

³¹ Out of 5 maximum points (1-5).

³² Most voted hypotheses

³³ Hypotheses rejected during the technical workshop

³⁴ Least voted hypotheses

5.0.2. Secondary data analysis of FSNAU data sets

Prior to data collection, a thorough complementary data analysis of FSNAU³⁵ of post *Deyr* and *Gu* seasonal datasets was conducted to understand potential associations and/or trends of identified risk factors with child undernutrition. Associations with undernutrition were identified with logistic and/or linear regression with odds ratios and significance reported, as appropriate. All statistical computing was performed in R. The complete findings from secondary data analysis are available in (Cf: [Annex 3](#)).

In the livelihood zones within districts covered by this study, the likelihood of being wasted was significantly associated with a child's sex, as boys were more likely than girls to be diagnosed with malnutrition (GAM).³⁶ Diarrhea was also significantly associated with wasting in all study areas. Other variables which were statistically associated with child undernutrition in various districts are shown in [Table 7](#).

Table 7: Secondary data statistical association (Source: FSNAU Data)

Indicator	Summary statistical association findings			
	SO 19 IDP Settlement Kahda	SO 05 Pastoral LZ Goldgob	SO 15-16 Agro-pastoral LZ Baidoa	SO 13 Riverine LZ Beltweyne
Sex of child	Boys were more likely to be malnourished by GAM than girls. The odds of a female child aged 6 to 59 months, diagnosed with malnutrition about 34% lower than that of a male IDP child of the same age and also living in Mogadishu.	Boys more likely to be malnourished by GAM than girls. The odds of a girl within the same age range being diagnosed with malnutrition were about 27% lower than that of a boy.	Boys were also more likely to be malnourished by GAM than girls. The odds of a female children aged 6 to 59 months who lives in Bay of being malnourished was 20.1% less than that of a male child in the same age range.	Boys were also more likely to be malnourished GAM than girls. While boys were more likely than girls to be wasted, the odds of girls aged 6 to 59 months diagnosed with GAM were about 17% less than that for boys of the same age).
Child Morbidity /Disease	Child illnesses, specifically diarrhea and pneumonia, were positively correlated with child undernutrition. A child who had an incident of diarrhea or pneumonia within the past two weeks had an odds of about 39% or 62% greater, respectively, of being malnourished by GAM than that of a healthy child.	The only other risk factor significantly associated with wasting in Mudug was diarrhea. Children who had a case of diarrhea within two weeks had higher odds of being diagnosed with Malnutrition about 85% higher than those who did not have diarrhea.	If a child had recently experienced diarrhea, measles, or pneumonia, she or he was more likely to be undernourished. The odds of being malnourished increased by about 258%, 144%, and 221% for those children with diarrhea, measles, or pneumonia, respectively compared to a child who was not ill with one of these three diseases	A child who was or had recently been sick was more likely than his or her healthier peers to be undernourished. If a child had a case of diarrhea or measles in had higher odds of having GAM were about 45% and 242% higher, respectively, than child who had not been ill.

³⁵ Food security and nutrition analysis unit.

³⁶ A significant correlation between sex and the fourth location, Hiraan (Belet Weyne), is also present when the significance level is at 10%.

Dietary diversity and Coping strategy	A more varied diet and the application of fewer coping strategies were associated with higher weight-for-height z-scores.		Higher reduced coping strategy index (rCSI) was negatively associated with a child's weight-for-height score.	
Unique Associations				
SO 19: Length of stay at current residence	Mogadishu IDP data indicated how long a household had resided at their current location. An increase in length of stay was positively associated with a child's higher weight-for-height z-score.			
SO O5: Drinking water source	The odds of a child, whose household's primary drinking source was unprotected, of being wasted were about 24% higher than a child whose household drank from a protected water source.			
SO 15-16: Household size	Child's household size was significantly correlated with undernutrition. Each additional household member reduced a child's weight-for-height z-score, on average, by about 0.024.			
SO 15-16: Household nutritional status	Household members' nutritional status (a mother's nutritional status) with that of a child's, was positively correlated with a child's weight-for-height z-score.			
SO 13: Woman as main provider	Children in households where a woman was the main provider or one of the main providers of food and/or income were less likely to be wasted, but also more likely to be stunted than a child in a household where only men provide food and/or income. These findings relate to the questions raised by the association between a mother's MUAC score and a child's nutritional status. When a woman is involved in the provision of food and/or income for the household, she is likely to have a direct say in the types of foods purchased. In such an instance, a mother's knowledge of nutrient-rich foods would likely carry over into their procurement and, eventually, the proper nutrition of her children.			

5.1. Health

5.1.1. Childhood illnesses

Descriptions of a healthy child varied only slightly across districts; mothers from Kahda and Goldogob characterized a healthy baby as a one who breastfeeds well, eats well, plays and is aware of what is happening around them, and when able, plays with other children. Absence of these behaviors is understood as an indication of illness. In Baidoa, the description of a healthy child included the observation of a child fully developed, a child that cries when hungry and is able to grab the breast and breastfeed well when given the breast, a baby that has good appetite and feeds well when given food. Other signs of a healthy baby according to the mothers is a baby that is jovial and smiles when you look at him. In Beltweyne, a healthy baby was described as having a medium build body corresponding with the height and the age, breastfeeds well, eats well, plays and is aware of their surroundings.

The decision to take the child for treatment in Kahda, Goldogob and Baidoa was taken by both the mother and the father. The health seeking itinerary was dependent upon the child's condition. If such a child is very sick, i.e. with diarrhoea or severe fever, this will call for a quick intervention, but if the child's illness is mild, then the child's condition is observed for a few more days to see whether he will recover without been taken to the hospital. In Beltweyne and Kahda, it was mentioned that if the treatment involved financial cost, then the mother needs to discuss with the father before she makes decision on the treatment.

Across all surveyed areas, preventive measures mentioned as important for maintaining health of the child included immunization, bathing children at regular intervals, feeding them nutritious foods and breastfeeding them regularly.

In Beltweyne, child vaccination is widely accepted; however, a few community members refuse to vaccinate their children due to hard held beliefs, such as children getting sick after treatment, exposure of children to unknown diseases, or suspicions in contemporary treatment. It was mentioned that mothers attend antenatal clinic and will request health staff to conduct check-up. While most pre-natal mothers comply with the tetanus toxoid vaccine but fear of pain, some hold the belief that the vaccine causes infertility or delay in conceiving. Common childhood illnesses mentioned and their perceived causes and treatment from all districts are shown in [Table 8](#).

Table 8: Childhood illnesses and perceived cause and treatment

Illness	Perception of the cause	Treatment	Community explanation
<ul style="list-style-type: none"> ▪ Diarrhoea ▪ (<i>shuban</i>)³⁷ 	<ul style="list-style-type: none"> ▪ Drinking dirty water. ▪ Consuming foods that were not covered before eating ▪ Poor hygiene, and lack of hand washing practices. <p>Additional from Beltweyne:</p> <ul style="list-style-type: none"> ▪ “Bad” tooth in babies ▪ Breastfeeding while the mother is pregnant ▪ When a child or pregnant mother sleeps outside, a certain bird fly over them and the child present with greenish diarrhoea with whitish stuff in it. This is called <i>Xaad or geed kore or Qolada sare</i> 	<ul style="list-style-type: none"> ▪ Treated at the nearest health care centre/hospital. ▪ Giving water with sugar and salt (homemade ORS). ▪ Providing shop brought ORS and other fluids such as lemon juice. ▪ Lemon juice and sour milk drink. ▪ Referring to treatment for diarrhoea, a TBA from Goldogob commented; “For the foresighted mother, she will always keep a goat to milk closely. These animals nourish the children during times of stress and hardship” <p>Addition from Beltweyne</p> <ul style="list-style-type: none"> ▪ Sour milk drink and stop fresh milk. ▪ For “<i>Xaad or qolada sare</i>” the treatment is application of herbs on the forehead and along the suture lines and recitation of Quran. ▪ For <i>Ilkow</i> – the best remedy is to extract the affected tooth. 	<ul style="list-style-type: none"> ▪ Associated diarrhoea with poor hygiene and the consumption of dirty water and food. ▪ It was also indicated that families with many children, living in poor housing conditions (especially IDPs) are also prone to the illness. <p>Additional from Beltweyne</p> <ul style="list-style-type: none"> ▪ Children who didn’t breastfeed well will have diarrhoea. ▪ Children whose mother died or orphan are prone to diarrhoea, ▪ Children who have no access to livestock milk are weak to diseases.
Fever/Malaria (<i>qanda</i>) ³⁷	<ul style="list-style-type: none"> ▪ Mosquitoes. <p>Addition from Beltweyne</p> <ul style="list-style-type: none"> ▪ Flu 	<ul style="list-style-type: none"> ▪ Treated at the nearest health care centre/hospital. ▪ Qur’anic treatment. ▪ Bathing and tepid sponging. <p>Addition from Beltweyne</p> <ul style="list-style-type: none"> ▪ Bathing, reducing clothes on the body and airing ▪ Given aspirin or syrup 	<ul style="list-style-type: none"> ▪ Children will get malaria if they do not sleep in mosquito nets. Parents acknowledge that they should ensure children sleep in nets when possible.
<ul style="list-style-type: none"> ▪ Pneumonia(<i>kolbo aria’, ‘waranta’, or ‘qar jeex’</i>)³⁷ 	<ul style="list-style-type: none"> ▪ Common cold (‘hergeb’). ▪ Children playing outside when it rains. ▪ Children left in the cold without good clothes that cover the chest. <p>Addition from Kahda and Goldogob</p> <p>Children sleeping outside at night.</p>	<ul style="list-style-type: none"> ▪ Treated at the nearest health care centre/hospital. ▪ Giving children eggs mixed with ghee. ▪ Applying ‘<i>malmal</i>’, the juice of a certain tree on the chest. 	<ul style="list-style-type: none"> ▪ Participants indicated that children can easily get pneumonia if exposed to cold.

³⁷ Somalia local dialect for diseases

<ul style="list-style-type: none"> ▪ Measles (<i>jedaaca</i>)³⁷ 	<ul style="list-style-type: none"> ▪ Acquired from other children with the disease. 	<ul style="list-style-type: none"> ▪ Treated at the nearest health care centre/hospital. ▪ Immunization. ▪ Qur'anic treatment. ▪ Addition from Beltweyne ▪ Bathed with fresh blood and wrapped in freshly skinned livestock skin or hide 	<ul style="list-style-type: none"> ▪ Participants identified this as a killer disease of children and that children with the disease should be quickly taken to hospital.
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The above common childhood illnesses were linked to seasonality, with malaria episodes being most prevalent just after the *Gu* rains season in Kahda and Goldogob, while in Beltweyne and Baidoa it is most prevalent towards the end of *Gu* rainy season and within the *Gu* rainy season, respectively. This is attributed to the effect of environmental temperatures variation,³⁸ where Kahda and Goldogob are relatively warmer than Baidoa and Beltweyne.

Diarrhoea prevalence was reportedly most prevalent across all livelihood zones during the dry seasons, with some variations. Diarrhoeal episodes were reported in all livelihood zones in the months of January and took one or two months. According to the IDP's in Kahda and Agro-pastoral livelihood zones in Baidoa, diarrhea peaked in July- August. Diarrhea in Goldogob Pastoral livelihood zone spikes three times a year (Cf: [Table 9](#)). This is linked with periods of water scarcity leading to compromising household hygiene practises.

The pastoral livelihood zone in Goldogob was also affected during the start of rains which could be attributed to the utilization of rain water from water pans and *Barkads*³⁹ which are contaminated with both human and livestock wastes. Goldogob community linked diarrhoea increase to seasons where households are faced with low milk access and water scarcity. It was also mentioned that collection and transportation of milk in plastic containers could be a contributor to diarrhea due to inadequate container cleaning.

According to the Link NCA quantitative data, the prevalence of diarrhea was low across the study zones. The prevalence of diarrhea based on a two-week recall period in SO 19 livelihood zone of Kahda district was 7.3% (5.7 - 9.5 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household indicated a significant statistical association between children who had diarrhea, meaning that children in SO 19 livelihood zone who experienced diarrhea during the two-week recall period prior to the data collection were more likely to be acutely malnourished by WHZ, MUAC, and cGAM. The proportion of children who had diarrhea and were treated with oral rehydration salt (ORS) and zinc were 65.5% (51.3 - 77.4 95% CI) (Cf: [Annex 2](#)). Analysis of FSNAU data indicated a higher prevalence of diarrhea at 47.8% (46.6 -48.9 95% CI) with further analysis showing a significant association with these indicators , meaning children with diarrhea during the two weeks recall period for Mogadishu IDP were more likely to be acutely malnourished by WHZ (Cf: [Annex 3](#)) The differences in diarrhea prevalence from Link NCA data and FSNAU data could be attributed to seasonality differences of data collection)

The prevalence of diarrhea according to the Link NCA quantitative data based on a two-week recall period for SO 05 livelihood zone of Goldogob was 4.0% (2.5 -6.4 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household indicated a significant relationship with these indicators, meaning children who experienced diarrhea two

³⁸ Source: Krijn P. Paaijmans et al, 2010, Influence of climate on malaria transmission depends on daily temperature variation.

³⁹ Barkads: underground water reservoir harvesting rain water run-off

weeks prior to the survey date were more likely to be acutely malnourished by MUAC and cGAM. A weaker relationship was observed between diarrhea and child malnutrition by WHZ, as children with diarrhea were marginally more likely to be malnourished by WHZ (p-value <0.1). The findings further reveal that 63.2 % (33.0 – 85.6 95% CI) of children who had diarrhea were treated with ORS and Zinc (Cf: [Error! Reference source not found.](#)). Analysis of FSNAU data indicated prevalence of diarrhea was at 11.3% (10.2 -12.5 95% CI). Subsequent analyses taking into account child acute malnutrition indicated a statistical association, meaning that children with diarrhea during the two week recall period in SO 05 Livelihood zone of Goldogob were more likely to be acutely malnourished by WHZ (Cf: Annex 3). The differences in Diarrhea prevalence from Link NCA data and FSNAU data could be attributed to seasonality differences of data collection.

The prevalence of diarrhea according to a two-week recall period in the SO 15-16 livelihood zone of Baidoa district according to the Link NCA data was 1.5% (0.5 -2.7 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household indicated a significant relationship between children who had diarrhea, meaning children who experienced diarrhea two weeks prior to the survey date were more likely to be malnourished by MUAC. The findings further indicated that none of those who had diarrhea were treated with ORS and Zinc (Cf: [Error! Reference source not found.](#)). Analysis of FSNAU data indicated prevalence of diarrhea during the recall period was 9.4 % (8.8- 95% CI). Subsequent analyses indicated a significant association with child acute malnutrition, meaning that children with diarrhea during the recall period for Baidoa were more likely to be acutely malnourished by WHZ (Cf: [Annex 2](#)). The differences in diarrhoea prevalence from Link NCA data and FSNAU data could be attributed to seasonality differences of data collection

According to the Link NCA data, the prevalence of diarrhea in a two-week recall period in SO 13 Livelihood zones of Beletweyne was 1.0% (0.0-2.1 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household indicated a significant relationship between children who had diarrhea, meaning children who experienced diarrhea two weeks prior to the survey date were more likely to be acutely malnourished by MUAC (Cf: [Annex 2](#)). Analysis of FSNAU data indicated prevalence of diarrhea during the recall period was 14.1 % (12.9 -15.5 95% CI), Subsequent analyses indicated a significant association with child acute malnutrition, meaning that children with diarrhea during the recall period for SO 13 livelihood zone were more likely to be acutely malnourished by WHZ (Cf: [Annex 3](#)). The differences in diarrhoea prevalence from Link NCA data and FSNAU data could be attributed to seasonality differences of data collection

The Link NCA data analysis indicated the prevalence of fever during a two-week recall period in SO 19 Livelihood zone of Kahda was 15.2% (12.6-18.2 95% CI). The prevalence of children who had both fever and diarrhea were 2.9 % (2.0 – 4.4, 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household indicated a significant relationship between these indicators, as children who experienced fever, fever and diarrhea two weeks prior to the survey date were more likely to be acutely malnourished by MUAC and cGAM). The prevalence of fever according to Link NCA data in SO 05 livelihood zone of Goldogob was 11.1% (7.6-15.9 95% CI). The prevalence of children who had both fever and diarrhoea were 0.9 % (0.4- 2.0 95% CI). Subsequent analyses taking into account anthropometric measurements of children in households indicated a significant statistical association with children who had both fever and diarrhea, meaning children who had both fever and diarrhea were more likely to be acutely malnourished by MUAC. The prevalence of fever in SO 15-16 Livelihood zone of Baidoa according to the Link NCA data was 16.7% (14.4-19.3 95% CI). The prevalence of children who had both fever and diarrhea was 0.8 % (0.4 – 1.7 95% CI). Subsequent analysis taking into account

anthropometric measurements of children in households indicated significant statistical association with child who had both fever and diarrhea meaning children who had both fever and diarrhea were more likely to be malnourished by MUAC. The prevalence of fever in SO 13 Livelihood zone of Beletweyne according to the Link NCA data was 6.7% (4.2-10.4 95% CI). The prevalence of children who had both fever and diarrhea was 0.1% (0.0 – 1.0 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household indicated a significant relationship between these indicators, as children who experienced fever two weeks prior to the survey date were more likely to be acutely malnourished by MUAC (Cf: [Annex 2](#))

According to the Link NCA data, the prevalence of cough during a two-week recall period in SO 19 livelihood zone of Kahda was 9.4% (7.4-11.9 95%CI). Subsequent analyses taking into account anthropometric measurements of children in the household indicated a significant relationship between these indicators, as children who experienced cough two weeks prior to survey were more likely to be acutely malnourished by MUAC. The prevalence of cough in SO 05 Livelihood zone of Goldogob was 12.3% (8.6-17.3 95% CI); with subsequent analyses indicated marginal statistical significance (p value <0.1). This means that children who had cough two-weeks prior to survey date were marginally more likely to be acutely malnourished by MUAC. The prevalence of ARI in SO 15-16 Livelihood zone of Baidoa was 14.1% (11.8-16.7 95% CI). Subsequent analyses indicated no significant statistical association between this indicator and child acute malnutrition. The prevalence of cough in SO 13 Livelihood zone of Beletweyne was 3.2% (1.8-5.5 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household indicated a significant relationship between these indicators, as children who experienced cough were more likely to be acutely malnourished by MUAC (Cf: [Annex 2](#))

The prevalence of children who had fever or diarrhoea or cough in the SO 19 livelihood zone of Kahda was 24.1% (21.1 – 27.4 95% CI) with subsequent statistical analysis indicating significant association, meaning children who had fever or diarrhoea or cough were more likely to be acutely malnourished by MUAC and cGAM. In the SO 05 livelihood zone of Goldogob district, the prevalence of children who had fever or diarrhoea or cough was 20.9% (16.1 – 26.6 95% CI) with subsequent statistical analysis indicating significant association, meaning children who had fever or diarrhoea or cough were more likely to be acutely malnourished by MUAC. In the SO 15-16 livelihood of Baidoa district, the prevalence of children who had fever or diarrhoea or cough was 23.5% (21.0 – 26.2 95% CI) with subsequent statistical analysis indicating significant association, meaning children who had fever or diarrhoea or cough were more likely to be acutely malnourished by MUAC. In the SO 13 livelihood of Beletweyne district, the prevalence of children who had fever or diarrhoea or cough was 9.4% (6.0 – 14.7 95% CI) with subsequent statistical analysis indicating significant association, meaning children who had fever or diarrhoea or cough were more likely to be acutely malnourished by MUAC and cGAM (Cf: [Annex 2](#))

Analysis of FSNAU data indicated the prevalence of pneumonia during a two-week recall period in the Mogadishu IDP settlement, where SO 19 livelihood zone of Kahda district is located, was 12.7% (11.9 – 13.4 95% CI). Subsequent analyses taking into account anthropometric measurements of children indicated a significant relationship with children who experienced pneumonia being more likely to be acutely malnourished by WHZ. The prevalence of pneumonia in Mudug region, where SO 05 livelihood zone of Goldogob district is located, was 15.3% (14.1-16.7 95% CI). Subsequent analyses did not reveal a significant statistical association between this indicator and child acute malnutrition. This means children who had pneumonia two weeks prior to survey were not more or less likely to be acutely malnourished. Analysis of FSNAU data for Bay region, where SO 15-16 livelihood zone of Baidoa district is located, shows the prevalence of pneumonia in was 4.8% (4.4-5.4 95% CI). Subsequent analyses taking into account anthropometric

measurements of children indicated a significant relationship between these indicators, as children who had experienced pneumonia two weeks prior to survey were more likely to be acutely malnourished by WHZ. The same FSNAU data for Hiran region, where SO 13 of Beletweyne district is located, indicated prevalence of pneumonia was 12.4 % (11.3-13.7 95% CI). Subsequent analyses did not indicate a significant statistical association between this indicator and child acute malnutrition. This means children who had pneumonia two weeks prior to survey were not more or less likely to be acutely malnourished (Cf: Annex 3)

IDP communities in Kahda district which participated in the qualitative inquiry identified pneumonia to be prevalent during the start of rainy season, mainly Gu-rains, attributed to changes in weather from warm to cold, as well as household congestion mainly affecting IDPs. In Goldogob, however, the peak of pneumonia was during the dry season, which can be attributed to poor housing made of plastic sheeting. Household members do not stay inside the house during the day as it is extremely hot, while at night it is too cold. During the day, they stay outside in the hot sun as the condition in the house is unbearable and few to no trees offer shade. The blowing wind can expose the children to diseases.

Analysis of FSNAU data indicated the prevalence of measles during the two-week recall period in Mogadishu IDP, where SO 19 Livelihood zone of Kahda district is located, was 4.2 % (3.7-4.7 95% CI) with no significant association between this indicator and child acute malnutrition. This means children who had measles two weeks prior to survey in SO 19 livelihood zone were not more or less likely to be acutely malnourished. The prevalence of measles in Mudug region, where SO 05 Livelihood zone of Goldogob district is located, was 2.7 % (2.2- 3.4 95% CI), with no significant association between this indicator and child acute malnutrition. This means children who had measles two weeks prior to survey in SO 05 livelihood zone were not more or less likely to be acutely malnourished (Cf: [Error! Reference source not found.](#))

In the Bay region, where SO 15-16 livelihood zone of Baidoa district is located, the prevalence of measles was 1.4% (1.1-1.7 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household indicated a significant relationship between these indicators, as children who had measles were more likely to be acutely malnourished by WHZ (Cf: [Error! Reference source not found.](#)). In Hiran region, where SO 13 livelihoods of Beletweyne district is located, the prevalence of measles was 0.4 % (0.2-0.7 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household indicated a significant relationship between these indicators, as children who had measles in this livelihood zone were more likely to be acutely malnourished by WHZ (Cf: Annex 3)

Measles transmission which is primarily by airborne respiratory droplets, increases during late winter and early spring in temperate climates and after rainy season in tropical climates (WHO⁴⁰). Measles which is spread by coughing and sneezing, in close personal contact or direct contact with infected persons was most prevalent during the dry seasons in all the districts (Cf: [Table 9](#)).

The seasonality of disease occurrence as per the qualitative inquiry is shown in [Table 9](#).

Table 9: Seasonal calendar of predominant childhood illnesses, in selected livelihood zones within the four districts

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Climate												

⁴⁰ Source: Who.int/ith/diseases/measles/en

Season	Jilaal Dry season		Start of Gu rains-Main Season			End of Gu Rains and start of Hagaa dry season			Deyr short rains Season			
Rainy seasons			KGB	KGBN ⁴¹	KGBN	N				KGB N	KGB N	KGBN
Dry seasons	KGBN	KGB N	NNN			KGB	KGBN	KGBN	NNN			
Health												
<i>Diarrhoea</i>												
Kahda	+++	+++					+++	+++				
Goldogob	+++					+++	+++		+++	+++		
Baidoa	+++	+++	+++			+++	+++	+++				
Beltweyne		+++	+++			+++						
<i>Malaria</i>												
Kahda			+++	+++						+++	+++	+++
Goldogob			+++	+++						+++	+++	+++
Baidoa					+++	+++					+++	+++
Beltweyne	+++	+++				+++	+++					+++
<i>Pneumonia</i>												
Kahda			+++	+++								
Goldogob							+++	+++	+++			
Baidoa			+++	+++								
Beltweyne			+++				+++	+++				
<i>Measles</i>												
Kahda	+++	+++					+++	+++				
Goldogob	+++	+++				+++	+++	+++				
Baidoa	+++	+++				+++	+++	+++				
Beltweyne	+++	+++	+++									
Colour code Key	K ⁴²		G ⁴³			B ⁴⁴			N ⁴⁵			

5.1.2. Access and utilization of health facilities

Universal health coverage is attained when people actually obtain the health services they need and benefit from financial risk protection. Access, on the other hand, is the opportunity or ability to obtain health services needed and benefit from financial risk protection. Hence, universal health coverage is not possible without universal health access. Health access has three dimensions, namely: physical accessibility, financial affordability and acceptability.⁴⁶ A description of the health characteristic in respective Livelihood zones under study is summarized in Table 10.

Table 10: Description of health systems in the study areas

District	Description of available health services and Barriers to access
SO 15-16 Baidoa district	<p>Description of healthcare</p> <ul style="list-style-type: none"> Baidoa has two main general hospitals which act as the main referral hospitals in the town, generally in the Bay region and surrounding areas. One is under management of the South West state of Somalia ministry of health. The second hospital is the Bayhaw general hospital, a privately-run hospital under the management of a local NGO called SADA, based in Baidoa. The two hospitals provide a wide range of services such as diagnostic services, consultations, surgery, and treatment, maternity and preventive services and handle both outpatient and inpatient cases. They operate 24 hours daily and are ready to respond to emergency cases once the cases are reported at the health facility. The two general hospitals have various cadres of staffing such as doctors, nurses, laboratory and nutritionists. The staffing levels of the MCHs are mainly nurses, laboratory and nutrition staff.

⁴¹ K=SO-19 LZ of Kahda, G=SO 05 LZ of Golodgob, B=SO 15-16 LZ of Baidoa, N=SO 13 LZ of Beletweyne

⁴² Kahda District(K)

⁴³ Goldogob District (G)

⁴⁴ Baidoa District(B)

⁴⁵ Beltweyne District (N)

⁴⁶ Source : <https://www.who.int/bulletin/volumes/91/8/13-125450/en/>

	<ul style="list-style-type: none"> ▪ The health service delivery is heavily supported by the non-governmental organizations such as UNICEF, WHO, World Vision, Save the Children and others. These organizations pay health facility salaries, provide essential supplies like drugs, vaccines and medical equipment and support outreach and mobile services. ▪ The host community members and the IDP populations in Wadajir have good access to healthcare, due to nearness to health facility. <i>“The Bay regional hospital operates for 24 hours and throughout the week, while the health posts operate between 8:00 am to 2:00pm. The staff are very welcoming and supportive when people visit the health facilities both at the Bay regional hospital and the health posts”</i> ▪ All the staff in the health facilities were reported to be locals and they speak the local language so communication between the staff and the local community is good. ▪ The community members demonstrated that they were satisfied with staff skills and experiences as well as their availability at the health facilities.
SO 13 Beltweyne district	<p><u>Description of healthcare</u></p> <ul style="list-style-type: none"> ▪ Besides the main District Hospital, Beltweyne District population is served by fixed health facilities as well as mobile clinic teams with weekly village visits. ▪ The District hospital is administratively under the local government management but service delivery is run by humanitarian organizations. ▪ Both fixed facilities and the mobile health clinics are run by different NGOs⁴⁷. Supporting various health components. ▪ Other communities in the District, i.e. Jawil, have constructed and employed health personnel through community initiative and support from diaspora who hail from the community. ▪ The services offered, at the model the health facility can be equated to the standard of health center. There is one medical doctor, 3 nurses, one traditional birth attendant (TBA) and two TBA trainees. The community health facility sits on one side of huge land reserved for future expansion and secured with large parameter wall. Such community-initiated facilities are not many in the District and community members can access the facility 6 days a week. The doctor, nurses and the midwife are all available in case of emergency. Daily operating hours for these community facilities are from 7:30am through 5pm in the evening with one-hour break between 12:30 to 1:30pm.
SO 05 Goldogob district	<p><u>Description of healthcare</u></p> <ul style="list-style-type: none"> ▪ In Goldogob, residents of each village had access to MCH's, although to differing levels. ▪ The Goldogob general hospital is preferred over the private clinics due to the provision of free services for children, hospital in-patient services and feeding, although residents comment they are required to pay for Lab tests and treatment. ▪ There was noted adequate health facility opening hours 6 am-12pm, and 3-5 pm, Goldogob where they offer common services (antenatal, basic treatment, health education, and deliveries. ▪ In some parts of the District, i.e. Darussalam, community members noted good health services, friendly staff and medical supplies are 'adequate', with health facility open from 7:30 am to 5:30 pm with some Breaks. ▪ Health facility staff members are friendly, speak their language, and are trustworthy. They are also available out of working hours through phone calls or visitation to their homes. ▪ Community members noted that they frequent the facility because <i>“the facility is run by someone we know”</i>
SO 19 Kahda district	<p><u>Description of healthcare</u></p> <ul style="list-style-type: none"> ▪ The District is served by 14 Maternal and Child Health Clinics (MCH's) run by NGOs and managed by nurses, with an additional 2 public hospitals. <i>“In this country, Medicare is done privately, the government doesn't have the capacity to run health facilities. They mostly depend on partners like NGOs”</i> ▪ These MCH's are first-level health facilities which act as the first point of contact of health delivery for the communities which have been operating in Kahda for the last 6 years. ▪ Other areas in the District (Shimbiralle, Omar Fiyasko) is served MCH operating between 8am -5 pm. ▪ The area is also served by private MCH's (Al Biri and Makkah Hospital) which offer comprehensive services and accessible.

⁴⁷ CESVI, WARDI, SCI.

	<ul style="list-style-type: none"> Community members know about the existence of health facility and services provided “The community knows we are here and usually just come; we have an open-door policy” Kii from MCH health worker <p>There is noted difference in access to healthcare services between the host community and the IDPs.</p>
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Analysis of health access barriers in the respective livelihood zone was categorized into geographical, financial, temporal, socio-economic quality of care as shown in [Table 11](#).

Table 11: Barriers to healthcare access in the study zones

	Geographical barriers	Financial Barriers	Temporal Barriers	Socio-Cultural Barriers	Quality of care
SO 15-16 Baidoa district	Long Distance to health facilities: Makuda and Bonkai communities walk more than 7km in search of healthcare.	Transport cost to health facilities for far-flung communities very high.	Closure of health facilities due to lack of donor funding ⁴⁸ .	Caregiver workload during planting, weeding and harvesting seasons.	Medical stock outs, reported during times when the NGOs supported projects ends. Long queues at health facilities discourage households from seeking care instead opt for over the counter purchase of drugs at pharmacies.
SO 13 Beltweyne district	Lack of health facilities: Majority of villages do not have health facilities. Depend on health facilities in urban areas such as Beltweyne	Distance and cost: Access to health facility: On average seeking care in Beltweyne will cost between USD 140-400.	Use of non-conventional approach of treatment before decision to take the sick to the hospital. Home treatment and seeking the intervention of traditional healers are first options of treatment. Caregiver workload lead to delayed treatment, access to health facilities leading to Late health seeking.	Other associated costs: when a sick person is transported from the village, depending on the severity of the sickness, one or two persons will accompany to the Beltweyne town for treatment. Security restrictions: Closure and restriction/curfew on the two bridges Bundaweyn that connects <i>Dhanka Bari</i> and Bundaweyn settlement and <i>Liqiqato</i> bridge, which connect <i>Dhanka Bari</i> to <i>qoraxsin</i> settlement	Majority of households depend on Drug purchase from shops ⁴⁹ . Main hospital is free and operates 24/7 but medication is usually not available. In-correct use of medication is another factor that hinders the complete recovery of the patient from illness.

⁴⁸ In Kormari, there is one MCH that was been supported by World vision was closed due to lack of donor funding., while in Bonkai a health facility supported by CREDO has for the last 6(six) months not been in operation due to the lack of drugs and the staff have been reported to have also left the facility.

⁴⁹ Just like an ordinary customer, the patient or parent walks to the shop either ask for the drugs if they happen to know or explains the sign and symptom of the illness to the shop keeper who then dispense the drugs based on experience.

SO 05 Goldogob district	Distance: Some other areas of Goldogob i.e. Alaale are affected long distance ⁵⁰ .	Cost of healthcare: Treatment at the facility can cost between USD 35-70 depending on the illness		Extreme weather challenges. ⁵¹ Opportunity cost: for mothers to travel and stay with the sick child in the hospital, and the need to take care of the other children left at home.	Qualification of healthcare workers: health services at MCH. Health providers at lower level health facilities some of them acquired certificate courses and some of them learned on the Job by the virtue of being at the health facility..
SO 19 Kahda district	Distance to the MCH (<i>walking for an hour to the facility</i>) ⁵² , although accessible throughout all seasons.	High cost of care ⁵³ : The private MCH's available are costly to the majority (especially IDPs)	Short Health facility operation hours. ⁵⁴ IDPs search for productive activity during the day when health facilities are open and return when facilities have closed ⁵⁵ .	Favouritism in emergency service provision. ⁵⁶ Opportunity cost: IDPs prioritize looking for jobs to sustain other family member's instead of taking sick child to hospital. Perception among the host community that IDPs are carriers of illness, thus Avoid some health facilities utilised by IDPs due to fear that their children will be re-infected with disease affecting IDP population. Security road blocks ⁵⁷	Health supplies stock-outs ⁵⁸ .

Analysis of Link NCA quantitative data for SO 19 livelihood zone of Kahda district reveals that 60.7% (53.1-67.8 95%CI) of sick children were taken to the health facility. The proportion of sick children taken to a pharmacy was 12.1% (7.8 – 18.4 95% CI), while those who sought care from traditional remedies were only 1.0% (0.2-3.9 95%CI). The percentage of sick children who did not

⁵⁰ Mostly pastoralists who live in the village far away from urban centers or near health facilities. Transport is not always available; carrying a sick child is tiring.

⁵¹ During the dry season, the sun is extremely hot, and the sandy soil is loose making walking tough particularly between 9 am to 4 pm.

⁵² More for residence of Shimbiralle within Kahda.

⁵³ A KII from the village reported walking for an hour to the facility, "we have no choice as this is the only free service provider in the area."

⁵⁴ 0800 and 1400hrs presenting a challenge in access, caretaker return from casual daily activities.

⁵⁵ Mostly affects new IDPs whose healthcare access predominantly financial, and time constraints.

⁵⁶ Members indicated, for emergencies, it depends on how well they respect you.

⁵⁷ Hinders referrals of patients to higher levels facilities around Mogadishu.

⁵⁸ MCH only able to offer limited services due to resource and medication constraints due to frequent drug/medical supply stock outs.

seek treatment was 27.7% (21.4-35.0 95% CI). Subsequent analyses taking into account anthropometric measurements of children indicated a significant relationship between these indicators, as children who sought care at pharmacy were less likely to be malnourished by MUAC (Cf: Annex 3).

Utilization of health services in the same livelihood zone of Kahda district indicated vitamin A supplementation for children 12-59 months was 55.5%(45.5 -65.2 95%CI). The prevalence of Vitamin A supplementation for children 6-12 months, in the past one year was 43.9 %(36.2 – 59.9 95%CI). The prevalence of measles vaccination coverage confirmed by card and or mothers recall was at 72.9 % (64.7 -79.9 95% CI). BCG⁵⁹ coverage reached 75.0 %(71.4-78.3 95% CI), while deworming was 46.2% (37.4-55.2 95% CI). Subsequent analyses taking into account anthropometric measurements of children indicated a significant relationship between the following indicators; children aged 6-11 months and children aged 12-59 months supplemented with vitamin-A, were more likely to be acutely malnourished by MUAC and CGAM and MUAC respectively (Cf: [Error! Reference source not found.](#)). Upon discussion with stakeholders in the nutrition cluster, this counterintuitive association was suggested to be attributed to malnourished children enrolled in integrated management of acute malnutrition programs (IMAM) where they are supplemented with vitamin A as part of (IMAM) package. malnourished children identified at households could be already enrolled in IMAM program and were more likely to have received vitamin A supplementation. This is in a way is positive finding as it shows IMAM protocol is adhered to in management of malnutrition.

Analysis of FSNAU secondary data for Mogadishu IDP livelihood where SO-19 livelihood zone is, indicated the proportion of vaccinated⁶⁰ children was 82.2% (81.3 – 83.1 95% CI) with no significant statistical association with child acute malnutrition (Cf:[Error! Reference source not found.](#))

In SO 05 Livelihood zone of Goldogob district, 23.9% (14.4-36.8 95%CI) of sick children were taken to health facility. The proportion of sick children taken to pharmacy was 16.4% (9.9 – 25.9 95% CI), those who reported care from traditional remedies was 3.0% (0.9-9.4 95%CI), while those who did not seek treatment at all were 59.0% (46.2 -70.6 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household did not indicate a significant relationship between these indicators, meaning children were not more or less likely to be acutely malnourished based on utilization of health services in case of sickness (Cf: Annex 2)

Utilization of health services in the same livelihood zone of Goldogob district indicated vitamin A supplementation for children 12-59 months was 17.5%(10.7 -27.3 95%CI). Vitamin A coverage for children 6-11 months was 18.0 %(9.3 -31.8 95%CI). Measles coverage by card and mothers recall was at 35.9 % (25.3-48.0 95% CI). BCG coverage reached 29.9 %(21.6-39.7 95% CI), while deworming was 4.8% (2.6 -8.9 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household did not indicate a significant relationship between health utilization indicators, meaning children were not more or less likely to be acutely malnourished based on reported utilization of these health (Cf: Annex 2)

Analysis of FSNAU data for Mudug region where SO 05 livelihood is located indicated that the proportion of children who had been vaccinated was 93.3% (92.3 -94.2 95% CI), while vitamin A

⁵⁹ *Bacille Calmette-Guerin*

⁶⁰ Indication a child was vaccinated against measles or received at least one dose of the polio vaccination.

supplementation in the same livelihood zone was at 73.5% (71.9 – 75.1, 95% CI), with both indicators having no significant statistical association with child acute malnutrition (Cf: Annex 2).

In SO 15-16 livelihood zone of Baidoa district, 71.1% (64.5-76.9 95%CI) of sick children were taken to a health facility. The proportion of sick children taken to pharmacy was 22.0% (17.4-27.3 95% CI), those who sought care from traditional remedies were 18.5% (13.6 -24.7 95%CI), while those who did not seek treatment at all were 9.3% (6.0 -13.9 95% CI). Health access data mentioned allowed for multiple response during data collection. Subsequent analyses taking into account anthropometric measurements of children in the household did not indicate a significant relationship between these health access indicators, meaning children were not more or less likely to be acutely malnourished based on utilization of these health services (Cf: Annex 3).

Utilization of health services in the same livelihood zone of Baidoa district was varied; vitamin A supplementation for children 6-11 and 12-59 months was 48.8%(40.6-57.0 95% CI) and 50.5%(47.5 -53.5 95% CI) respectively. Measles coverage by card and mothers recall was 84.7 % (82.3-86.7 95% CI), while measles confirmed by card only was 59.3% (56.3 -62.2 95% CI), BCG coverage was at 48.8 % (40.6-57.0 95% CI) while children who had received both measles and BCG was 58.7 % (55.7 -61.7 95% CI). The proportion of children 12-59 months who had received deworming was at 65.4% (62.4-68.4 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household did not indicate a significant relationship between these health utilization indicators, meaning children were not more or less likely to be acutely malnourished based on their utilization of these health services (Cf: Annex 2) Analysis of FSNAU data indicated 72.6% (66.7 -79.0 95% CI) of children had received vitamin A supplementation. Subsequent analysis taking into account child anthropometry of indicated a significant association. This means children who had received vitamin A were more likely to be acutely malnourished by WHZ (Cf: [Error! Reference source not found.](#)). Discussion with stakeholder in the nutrition cluster and AIMWG suggested this counterintuitive relationship can be attributed to malnourished children in IMAM program given vitamin A as part of the IMAM Protocol. Malnourished children identified at households could be already enrolled in IMAM program and were more likely to have received vitamin A supplementation. This is in a way positive finding as it shows IMAM Protocol is adhered to in management of child acute malnutrition.

Analysis of FSNAU data for Bay region where SO 15-16 livelihood is located found out that the prevalence of vaccinated children was 22.0 % (21.0 – 23.1 95% CI), while the proportion of children who had received vitamin A supplementation was 7.2% (6.6 -7.9 95% CI). Subsequent statistical analysis indicated significant association between child vaccination and vitamin A supplementation with child acute malnutrition. The findings showed that children who had received Vitamin A supplementation and vaccination were more likely to be acutely malnourished by WHZ (Cf: Annex 3).

Upon discussion with the nutrition cluster this counterintuitive association was suggested to be attributed to malnourished children enrolled in integrated management of acute malnutrition programs (IMAM) where they are supplemented with vitamin A and vaccinated if they had not received required vaccine as part of (IMAM) package. Malnourished children identified at households could be already enrolled in IMAM program and were more likely to have received vitamin A supplementation and deworming. This is in a way positive finding as it shows IMAM Protocol is adhered to in management of child acute malnutrition.

Health access in the SO 13 livelihoods of Beletweyne district indicated that 10.1% (5.2-18.8 95%CI) of sick children were taken to the health facility. The proportion of sick children taken to

pharmacy was 34.8% (25.1-45.9 95% CI), those who reported care from traditional remedies were 7.3% (2.6-18.9 95%CI), while those who did not seek treatment at all were 31.9% (20.7- 45.7 95% CI). Subsequent analyses taking into account anthropometric measurements of children revealed a significant relationship with health access indicators in SO 13 livelihood zone, as children who were sick and taken to the health facility were actually marginally more likely to be malnourished by WHZ (p-value <0.1). It is important, however, to keep in mind that this association represents a small sample size, as only children who had been sick in the previous 2 weeks were presented with the health seeking source question (n=69) (Cf:Annex 2).

Utilization of health services in the same livelihood zone of Beletweyne district was relatively low; vitamin A supplementation for children 6-11 and 12-59 months was 13.2% (7.4 -22.4 95% CI) and 14.8% (9.6-22.0 95% CI) respectively. Measles coverage by card and mothers recall was at 32.9 % (21.9-46.2 95% CI) while measles coverage confirmed by card only was 3.7% (1.9 -6.9 95% CI). BCG⁵⁹ coverage was 28.1 % (18.8 -39.7 95% CI) while children who had received both BCG and measles was 3.3% (1.8 -6.0 95% CI).The prevalence of deworming of children 12-59 months was 23.2% (16.7-31.2 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household revealed a significant relationship between health utilization indicators, as children who had been supplemented with vitamin A and dewormed were more likely to be malnourished by MUAC , while other health utilization indicators did not reveal any significant association with acute malnutrition (Cf: Annex 2)

Analysis of FSNAU data for Hiran region where SO 13 is located indicated 31.9% (30.2-33.7 95% CI) of children had received vitamin A supplementation while those who were vaccinated⁶⁰ were 54.1% (52.2 - 55.8 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household revealed a significant relationship between these indicators, as children who had received vitamin A were more likely to be acutely malnourished BY WHZ (Cf: [Error! Reference source not found.](#))

Upon discussion with the nutrition cluster this counterintuitive association was suggested to be attributed to malnourished children enrolled in integrated management of acute malnutrition programs (IMAM) where they are supplemented with vitamin A and dewormed as part of (IMAM) package. Malnourished children identified at households could be already enrolled in IMAM program and were more likely to have received vitamin A supplementation and deworming. This is in a way positive finding as it shows IMAM Protocol is adhered to in management of child acute malnutrition.

5.1.2.1 Traditional practices and religious medication

In SO 19 Livelihood zone of Kahda district and SO 05 livelihood zone of Goldogob district, it was found out that religious leaders administer Qur'anic treatment, commonly referred to as '*ruqya*'. In addition to this being a religious act, it is favoured by some community member's, namely IDPs and poor host community members, due to some health facilities being financially and logistically prohibitive. The ministry of health (MoH) representative in Kahda district explained that traditional healers and spiritual healing, such as Quran healing, is less practised as majority of households now come for hospital treatment, a view contradicted by community discussions in Ligligado.

"The majority of the illness is first treated with the spiritual healing then we take them to the hospital". The majority explained that Qur'anic medicine is favored due to being offered freely, although as one KII reported that, "even some Quran readers will demand a fee". Qur'anic reading at the community level, daily, is also attributed to protecting the community spiritually and "ensuring relative peace in the District"

Focus group participants, Ligligado, Kahda

Herbal medicine is still practised predominantly due to culture and the fact that “old habits don't die easily”. FGDs with community members revealed that Female Genital Mutilation (FGM) and circumcision of boys are largely practised by traditional healers.

Diseases which are treated traditional healers are: ‘children with big heads / enlarged foreheads’⁶¹ is to be treated with fire burns and hot metals applied to the head by the traditional healer, tooth extraction (*ilkrow*), Hepatitis⁶² (*cargarshoow*), fractures, haemorrhoid, nerve and *hijama*⁶³ treatments (*toobin*) were also commonly reported to be illnesses treated by traditional healers. Traditional healers utilise acacia gum, eggs, Aloe Vera, black seed⁶⁴, honey and lemon in their treatments and are known to also charge a fees.

A health worker in SO 19 Livelihood zone of Kahda district commented that there was an increase of households who reported taking their children to health care facilities as opposed to alternative traditional methods as most MCH's are run by NGO's and the provision of services is free.

In SO 15-16 Livelihood zone of Baidoa district, it was found that the practice of religious oriented treatment and traditional therapy were very common. The religious leaders or Imams were commonly consulted when there is a sick child at home and the mother/caretakers is not able to take the child to the hospital. Sometimes even after the child is taken to the health facility, some mothers will still seek religious treatment. Traditional therapy was also mentioned to be common in majority of the villages further away from urban areas with herbs called *xarmalle*⁶⁵ is collected from the bush dried, crushed, and consumed in tea/ milk or added to water for bathing young children with fever and diarrhoea. Also utilised is herb called *ab ab*. If the child doesn't recover; child is taken to the nearest health facility. There are also traditional healers who treat the big head condition medically referred to as *hydrocephalus*.

In the SO 16 livelihood zone of Beltweyne district, similar to other districts, there is a common perception that certain medical condition only requires only Quran recitation. These conditions include mental illness, epilepsy and seizures, loss of consciousness and fainting and other general chronic illness where other treatment options failed to relieve. In other treatment options, Quran reading goes side by side the other treatment course. The religious leaders do not demand money but accept voluntary payment or meals. Occasionally, households invite community members, including the religious leaders commonly known as sheikhs or *culumo*, for congregation Quran reading for the family. The congregation prayer for the family is meant to spiritually secure and protect the family from uncertain calamities such as sickness, “bad eye” and request blessing from God (Allah). In addition, it is a common practice for pregnant women to invite the community members (men and women) for congregation prayer when they are approaching childbirth. The purpose is to pray for safe delivery and health for both the mother and the unborn child.

Traditional medicine is still widely practiced in Beltweyne with local procedures commonly performed by the traditional healers including burning, incision, extraction (tooth extraction) and cutting in the case of uvula removal. Other common procedures include massaging and immobilization, in the case of fractures.

⁶¹ Condition referred to as hydrocephalus.

⁶² Treated by wrapping the patient in a fresh animal skin

⁶³ Cupping treatments

⁶⁴ Nigella Seed; Black seed is also recognized from a religious perspective as the Holy Prophet (peace be upon him) said: “Use the black seed because it has a relief of all diseases, but death”.

⁶⁵ Root from a specified tree.

Incision procedure is utilized in the case of uvula, prepuce or foreskin removal in boys during circumcision, and haemorrhoid removal. Incision procedure is used on haematoma following injury and swellings of any part of the body including distended abdomen, as is the case of kwashiorkor. Other traditional procedure includes massaging (*riix*), capping (*toobin*), bathing with fresh blood and wrapping with fresh skin or hide. Traditional healers also utilise leaves, gum, seeds, juices, fruits and roots of specific trees to prepare herbal medicines. The healer often use honey as syrup for the medicines.

Analysis of Link NCA data indicate that few households reported taking their children to traditional health providers in SO 19 Livelihood Zone of Kahda district, SO 05 Livelihood zone of Goldogob and SO 16 Livelihood zone of Beltweyne district at 1.0 % (0.2-3.9 95% CI), 3.0 % (0.9-9.4 95% CI), and 7.3 % (2.6-18.9 95% CI) respectively. In the SO 15-16 Livelihood zone of Baidoa there were relatively higher number of children taken to traditional healers at 18.5 % (13.6-24.7 95% CI). Subsequent analyses in all four livelihood zones taking into account anthropometric measurements of children in the household did not reveal a significant relationship between these indicators, meaning children whose caretaker reported health-care from a traditional healer were not more or less likely to be malnourished (Cf: [Error! Reference source not found.](#)) It is important to note that use of traditional healers for common morbidities may have been underreported.

5.1.2.2. Pre- and Post-natal health practices

Pre and Post-natal visits are effective approaches of maternal health services to detect and save the life of the mother and new borne from life threatening complications⁶⁶. Qualitative enquiry found out that majority of the level 1 and 2 health facilities that residents in the four livelihood zones had access, were found to be offering pre and post-natal services. Focus group discussions (FGDs) held with women showed that pregnant women attend pre-natal services for check-up at the local health facility but do not deliver at health facilities due to the cost and other barriers (Cf: [Table 11](#)).

In the SO 19 Livelihood zone of Kahda district and the SO 05 Livelihood zone of Goldogob district, men and women were of the opinion that it was good for pregnant women to attend the antenatal clinic in order to check the health of both the mother and the baby. The barriers to ANC attendance mentioned were distance and maternal activities/workloads. Most women agreed that women prefer to deliver at home, even though they acknowledge this as a 'risky' action predominantly due to large families and relatives at home who are able to provide support and care, accompanied by the financial barrier (transport and treatment at health care facilities) Residents also cited unreliable ambulance services and the relative ease of mobilizing a traditional birth attendant as reasons to why home deliveries were preferred. A key informant interview with a TBA from Goldogob recounted her story of how she became a TBA and how residents engage her when they are due to deliver.

"I am 80 years old. I have been a traditional birth attendant for the last 40 years. My becoming a TBA was circumstantial; I found a woman in pain, all alone in the wilderness and in labour. She eventually had a stillbirth because of prolonged labour. She instructed me on what to do all the way to cutting the umbilical cord and burying the infant. It was sad, but women were largely neglected by the men at the time. Even today women continue to be neglected. I serve women in Qansahle and villages beyond including Udub, Galkacyo and Jariban. People come to my house to personally ask me for assistance. Sometimes I will stay with the woman for a week. Some women take very long to deliver, and in such cases we put them on a camel's back in order to speed up labour. We also pray to Allah for help"

⁶⁶ Xiaojing Fan et.al, exploring status and determinants of prenatal and postnatal visits in western China.

In SO 15-16 Livelihood zone of Baidoa, women reported that they were attending antenatal clinics when they had time. Traditional birth attendants and women engaged in the qualitative inquiry indicated that pregnant mothers in this livelihood zone had no problem with antenatal clinics and understood the benefits of attending the clinics. Women were not able to follow the clinic schedule due to commitment/daily routine, lack of transport and the distance of such facilities.

In SO 13 Livelihood zone of Beltweyne district, FGDs participants in all the four villages were of the opinion that it was a good thing for pregnant women to attend the antenatal clinic but cited distance and availability of health facility that offers ANC services as a barrier.

"Most villages in Beltweyne have no health facility and therefore, pregnant mother cannot access the service, ANC services are offered at few fixed MCHs in and around Beltweyne and few mobile clinics. Both fixed and mobile health clinics are operated by humanitarian organisation working in the region. Women will want to stay with their families and deliver at home if there is no complication. Most rural village do not have access to health facility any ways and the few health facilities in the villages do not have the necessary tools and equipment to support delivery."

TBA volunteer, Jawil, Beltweyne

Quantitative analysis of Link NCA data regarding pre-natal consultation and consumption of iron folic supplementation (IFAS) during pregnancy indicated a higher ANC and IFAS consumption in SO 19 Livelihood zone of Kahda compared with other LZ's. In this livelihood zone, the percentage of children's caretakers who completed at least one pre-natal consultation was 80.7% (75.9-84.8 95%CI), while consumption of IFA's was 79.3% (74.2-83.6 95% CI). The proportion of mothers who had pre-natal consultations during pregnancy and IFAS consumption in SO 05 Livelihood zone of Goldogob district were 60.3% (46.7-72.5 95%CI) and 49.0% (36.4-61.7 95% CI), respectively. In the SO 15-16 Livelihood zone of Baidoa district, the proportion of mother who had pre-natal consultations and consumed IFAS was 68.8% (64.0-73.3 95% CI) and 64.6% (59.6-69.4 95% CI) respectively. In the SO 13 Livelihood zone of Beltweyne district the proportion of mothers who had pre-natal consultations during pregnancy and consumed IFAS was 67.9 % (51.8-80.6 95% CI) and 49.1% (35.2-63.1 95% CI), respectively.

Subsequent analyses taking into account anthropometric measurements of children revealed a significant relationship between these indicators in SO 19 Livelihood zone of Kahda district and SO 15-16 Livelihood zone of Baidoa, as children whose mothers consumed IFA's during pregnancy were marginally less likely to be malnourished by WHZ or cGAM for SO 15-16 of Baidoa district (p-value <0.1). Children whose mothers consumed IFA's during pregnancy were significantly less likely to be malnourished by WHZ, MUAC or cGAM for SO-19 of Kahda district (Cf:[Error! Reference source not found.](#))

5.1.5. Early marriage, pregnancy and birth spacing

In the Somali community, children are highly valued and viewed as pillars of support for the family as well as a source of social wealth and a form of livelihood support (productive activities and supporting elderly parents). Close birth intervals are very common in the IDP camps attributed to low utilization of family planning services and close interactions between men and women, as a result of changes in livelihood patterns from their previous places of residence.

According to the community, the more children a family has, the 'richer' the family is. The value associated with having large families and many children came up in Kahda district community

discussions. In the Somali region, religious leaders play a prominent role in approving or disapproving the use of family planning in the communities⁶⁷.

The findings from SO 19 Livelihood zone of Kahda district indicated that family planning outside of natural⁶⁸ child spacing are not practiced, as they are not culturally and religiously accepted and that they are not ready to start using contraceptives as a family planning method. This was also confirmed by health personnel who reiterated that family planning services are not provided due to cultural and religious unacceptance.

"The number of children a woman is supposed to have is a natural thing. The woman is expected to continue giving birth until she goes beyond the age of delivery"

Focus group participants, Kahda

Across all social groups, there is strong cohesion in advocating for exclusive breastfeeding as a deterrent to low birth spacing. Low birth spacing is responsible for early child weaning and community members acknowledge the impact of this on the child's health and the link to malnutrition. Low child spacing also results in large family sizes; coupled with limited access to income sources, this could result in malnutrition as a result of inability of households to acquire food needs for large size.

"In this IDP camp mothers have many children (6 - 7) and then there is no reliable source of income it can result in malnutrition",

Traditional Birth Attendant, Liqliqato, Kahda

In SO 05 Livelihood zone of Goldogob district, similar value associated with having large families and many children were evidenced. During the community ranking exercise in Dar Salaam, a male respondent commented, *"Children are a blessing, the more the better. The problem is income and how to feed them"*. An elderly man while acknowledging the burdens that low child spacing brings to the families, highlighted that large family size would *'never be considered a risk factor'* in his community due to the value and blessing that children bring.

It was also found out in that there was peer pressure/competition amongst young girls who are married to have the highest number of pregnancies and childbirths, with intentional reduction of breastfeeding duration as a method get pregnant in order to both compete with their age-mates and to fulfil the premise that numerous children are a blessing. Quantitative analysis of FSNAU data for Mudug region where SO 05 livelihood zone of Goldogob district is located, indicates that children from large household size above a mean of five total members were more likely to be malnourished by WHZ (Cf: Annex 3).

As noted in other livelihood zones, in SO 15-16 LZ of Baidoa district, poor child spacing is common, with both men and women saying that as many children as possible should be born. There was a common sentiment that children are a blessing from Allah, viewed as a source of pride, a source of happiness.

"I will continue to produce as many children as possible as long as I can get them"

Focus group participant, Kormari, Baidoa

During qualitative inquiry in SO 15-16 Livelihood zone of Baidoa district, it was mentioned that IDPs had shortest birth interval and was common to see households with many children ranging from 10 -13 children. This can be attributed to men and women always together at home as they

⁶⁷ Source: Abdi-Aziz Egeh, Osman Dugseih, Kerstin Erlandsson and Fatumo Osman. (2019) 'The views of Somali religious leaders on birth spacing - a qualitative study', *Sexual and Reproductive Healthcare* (20), 27-31pp.

⁶⁸ "Extended breast feeding, or the absence of the father from the mother.

rarely leave the IDP camp to pursue other external source of incomes. Despite the inadequate income sources for the families in the IDP camps, both men and women during the assessment indicated that they will prefer to have many children.

There was a common perception in the agro-pastoral community that a mother who has child less than 2 years is not ready for another child and households prefer to have birth intervals between 2-3 years. Another common belief is extended breastfeeding for up to 2 years is a form of birth spacing. While most mothers and fathers in the rural areas practice breastfeeding for up to 2- 3 years, this sometimes fail to prevent early pregnancies.

In SO 13 Livelihood zone of Beltweyne district family planning is generally considered exotic with mothers using breastfeeding as a method of child spacing. Few women who participated in FGD's have knowledge of conventional methods of child spacing but said these methods were not culturally appropriate and religiously unaccepted.

*Narration of challenges to contraceptive use*⁶⁹

A TBA from one of the assessed villages was once invited for training by one of the humanitarian organisation working in the District. Child spacing was discussed as a challenge in one of the training sessions, and methods of family planning were discussed. The team narrated myths and perceptions around different forms of family planning. Communities belief that intrauterine device, injectable and oral tablet caused infertility. To help the mothers in child spacing and to involve the father, the trainees agreed on condom distribution. After the training, TBAs had collected a few male condoms to distribute to willing households. The TBAs decided to introduce the condom to the women first and one after the other she will invite women with low child spacing and speak to them about the new product. Close to all the women had the same feeling and their worry was "what happens if the condom remains inside or it's pushed up into the abdomen?" The TBA was not able to convince any of the women who paid a visit and later discarded the condom in the river.

5.2. Nutrition

Nutrition challenges continue throughout life cycle with poor nutrition starting in utero and extends particularly for girls and women well into adolescence and adult life spanning into generations, as shown in (Cf: [Figure 7](#)).⁷⁰

⁶⁹ Story narrated by TBA who was involved in the family planning program.

⁷⁰ Source: Baby WASH, ACF, 2017. Adapted by the LSHTM (2013) from ACC/SCN (2000) Fourth Report on the World Nutrition Situation. Geneva: ACC/SCN in collaboration with the International Food Policy Research Institute (IFPRI)

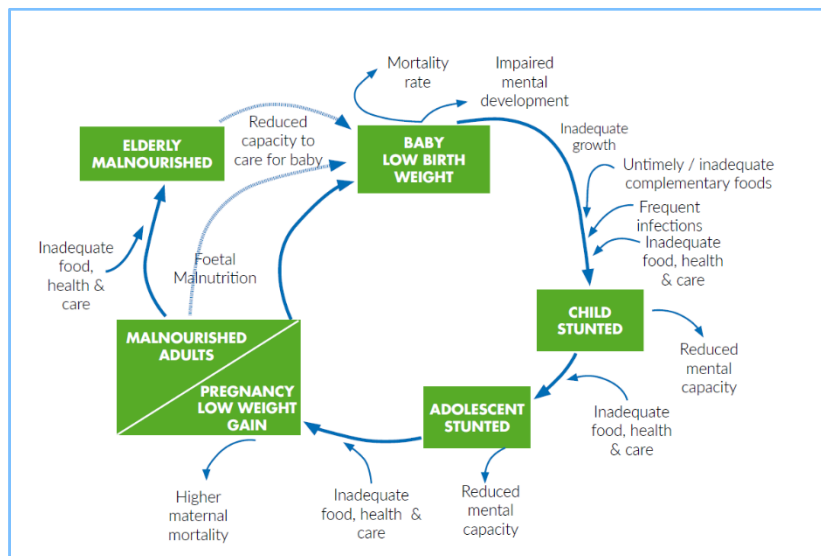


Figure 7: Life cycle of child undernutrition

5.2.1. Household food consumption

Households choose foods for consumption within the context of their own and their household's preferences and available resources⁷¹.

In SO 19 livelihood zone of Kahda district, findings from the NCA qualitative enquiry found noticeable differences in dietary diversity between households in the host community and residents of the IDP settlements. Due to the increased economic levels resulting from stable

employment and increased levels of land ownership, the host community provided more nutritious and diversified diet for all members of the household. Meals within the host community were more diverse (meat, milk, tea with milk, beans, rice, pasta, wheat flour, fruits and vegetables) than those from the IDP settlements, which relied on maize and beans. In terms of meal frequency, the host community consume between 3-4 meals a day (breakfast, mid-morning tea, lunch, 4 o'clock tea and super) with an increased frequency for children (between 5-6 times a days).⁷² Amongst the IDPs and urban poor, meal frequency is approximately 2 times a day for both adults and children (breakfast and supper). IDPs commented that, prior to displacement, they were engaging in crop production (maize, beans, sorghum, fruits such as bananas, mangoes, pawpaw and vegetables such as kale and spinach), which they used to supplement both their diet and income.

In the SO 15-16 livelihood zone of Baidoa, households in both rural areas, such as Makuda and Bonkai, and urban and IDP concentrated areas like Wadajir and Kormari were dependent on market purchases for most of their foods, with some households supplementing with their own crop production. In the agro-pastoral villages like Bonkai and Maculate, households meet their food needs through their own production, unless there is drought, the households had access to maize, beans, sorghum, bananas, pawpaw, ground nuts, onions, tomatoes, mangoes.

In areas like Wadajir, mainly settled by the host community, there is better access to food by the majority of households. Most households have better incomes because they are engaged in business activities, others work for the government, NGOs and some are self-employed undertaking small business enterprises and labour based economic activities.

In the SO 13 livelihood zone of Beltweyne, majority of the households prepared two meals a day with maize sorghum and beans being the main staple food. The two meals prepared in a day are breakfast and supper. Breakfast is often Somali pancake made of wheat flour and tea.⁷³ Supper is mostly maize mixed beans or maize flour (soor). Occasionally, when households get good income, include rice or pasta for evening meal. Fruits are relatively cheaper in Beltweyne compared to

⁷¹ Becker GS. A theory of the allocation of time. *Economic Journal*. 1965; 75(299):493-517.

⁷² Breakfast, mid-morning, lunch, mid-afternoon, super and sometimes milk is provided before they sleep.

⁷³ Somali pancake, 'Anjeera' is usually served with oil and sugar.

other study districts and therefore families in this district occasionally access fruits such as banana, mango, watermelon and pawpaw. Fish are an important supplementary food. The meal composition among different population groups in the study areas is shown in [Table 12](#).

Table 12: Meal composition for all communities, Kahda, Baidoa and Beltweyne districts.

Community	Breakfast	Mid-morning	Lunch	Mid-afternoon	Supper
SO-19 IDPs-Kahda IDP livelihood	Maize and beans.		Maize and beans leftover from breakfast.		Maize flour, 'soor'.
SO-19 Kahda Host community-	'Anjeera' and Black tea.	Tea with livestock milk.	Meat, Pasta, Bananas, Greens (cabbage, spinach), Potatoes, Rice.	Tea with livestock milk.	Rice and beans.
SO-15-16 Baidoa IDP	Maize/sorghum and beans Sometimes black tea		Left over from breakfast (maize/sorghum beans	.	Soor (maize flour) and greens during the rainy seasons Soor sour milk or soup made from offal
SO-15-16 Baidoa Agro pastoral community	Maize/sorghum and beans Sometimes black tea Sometimes milk for the young children during rainy seasons)		Left over from breakfast (maize/sorghum beans		Soor (maize flour) and greens during the rainy seasons Soor sour milk or soup made
SO-13 IDPs -Beltweyne	'Anjeera' and tea without milk Or Maize and beans (leftover).	Tea and powder milk for the younger children	Leftover from breakfast. Mothers leave a smaller portion of breakfast meal for midday meal for younger children.	-	Maize flour, 'soor'.
SO-13 Beltweyne Village communities	'Anjeera' and tea with milk	Tea with livestock milk for younger kids	Tea with livestock milk.	Tea with livestock milk.	maize and beans or maize flour (soor) or rice with beans
SO-05 Goldogob Pastoral drop out – IDPs	Somali pancake (<i>'Anjeera'</i>) with oil. Sugar and tea without milk. Powdered milk added for children.	Tea with milk (<i>'shah caano'</i>).			Rice, oil and sugar. Tea is sometimes served.
SO-05 Goldogob Pastoralists	Livestock milk. Tea with plenty of milk. 'Anjeera' or maize flour ('soor').	Tea with livestock milk for the children.	Tea with livestock milk for the HH. Maize flour with milk occasionally.	Tea with livestock milk for the children.	Milk for the children. Rice or maize flour for the household served with milk.
SO-05 Goldogob Urban households	'Anjera' and black tea.	Tea with milk (powdered).	Rice and canned/sachet soup.	Tea with milk (powdered milk).	Rice and beans.

5.2.2. Breastfeeding practices

Breastfeeding is the perfect food for healthy growth and development of infants up to six months, without introduction of other liquids or foods.⁷⁴ In SO 19 livelihood of Kahda district, women provide holy water, 'anzal water', for the baby within the first few hours of life. It was also found that mothers discard first milk (colostrum) with the thought that first breast milk is not good. There was noted knowledge among caregivers/mothers of the importance of exclusive breastfeeding, with majority of mothers report to continue breastfeeding even when they fall pregnant, despite identifying it as a 'risk'.⁷⁵ Breastfeeding during pregnancy was opposed by elderly women, who are of the opinion that, a pregnant mother's breast milk is not good for the baby. Breastfeeding during pregnancy was found not be practised within Abadir (host community) as they had increased access to secure employment and increased household income, so they can support the child nutritionally through complementary feeding as opposed to having to rely on breastfeeding during pregnancy. It was also found that women engage in exclusive breastfeeding practices as a method of child spacing, although they acknowledge that it is not highly successful. Frequent pregnancies were connected to the frequent cycle of 'weakness' and poor health amongst women and their children; *"if a mother frequently conceives she will become weak, this will make the child she gives birth to weak."* Breastfeeding was mentioned to take a toll on the health of the mother combined with the lack of rest they experience due to workload; they also report weakness as a result of breastfeeding. This is accompanied by the desire to eat more, although not always possible given the individual household situation. In addition, during periods of fasting, mothers report to actively breastfeed, whilst fasting themselves which also leads to increased weakness.

In the SO 15-16 livelihood of Baidoa, when a baby is born, water and milk diluted with water is given alongside breast feeding, it was also common practice that many mothers in the IDP camp breastfeed for only 3-4 months and breastfeeding of the baby stops, due to early pregnancy. Breastfeeding patterns for the babies below 6 months was found to be different among the mothers in the various villages, with female host community members in Wadajir indicating they breastfed regularly every day, which was possible because they are closer to their babies. Women who operate shops or market stalls normally carry their babies to the work place, while those who leave their babies at home when they go to the markets were able to come back quickly and suckle them.

In the SO 05 livelihood of Beltweyne district, exclusive breastfeeding like the other districts is influenced by belief that *anzal* (holy water) is given to "purify" or prepare the child for a better life, and women who have firm beliefs that they cannot produce enough milk for the child.⁷⁶ Mothers from Beltweyne understand the benefits of adequate breastfeeding, however, their long engagement in other activities and their absence from the homestead reduces their time with the young babies. Some mothers in villages like Bacaad, who work in markets, carry their babies with them, which improves breastfeeding but carrying around the child in town exposes the child to airborne illnesses like flu and ARI. A number of mothers said they would carry the children to the workplace, but there is a myth in all villages assessed that the mother cannot breastfeed right after work or from long walk because the mother body is 'hot' from the work she was performing. The belief is that if the mother breastfeeds immediately after work/walk or when she is hot, the child will develop illness particularly diarrhoea.

⁷⁴ Source: Who.int/nutrition/publications/infant feeding

⁷⁵ Participants did not elaborate on who was at 'risk', nor why they consider it risky. This response was elicited as part of the risk perception qualitative data collection activity.

⁷⁶ These women are locally referred to as Dooray.

“Long absence from the child reduces frequencies of breastfeeding and therefore the woman body registers the un-utilization of the breast milk. This further triggers the resumption of active fertility phase in the woman when the monthly period comes regularly and the mother gets pregnancy before the recommended two-year period because of the mother absence and inability to breastfeed the child”

Focus group participant, Bacaad, Beletweyne

Analysis of Link NCA data for SO 19 livelihood zone of Kahda district , shows that 70.0%(65.0-74.3 95%CI) of mothers were either pregnant or breastfeeding.The proportion of children 6-24 months who had ever been breast fed were 88.3% (82.7 - 92.3 95%CI), while while 57.8 %(41.7 - 72.3 95% CI) of children continued breastfeeding at one year. Subsequent analyses taking into account anthropometric measurements of children in the household did not reveal a significant statistical association between these indicators, meaning mothers physiological status and breastfeeding indicators were neither risk nor protective factors for child acute malnutrition by GAM (Cf: [Annex 2](#)).

In the SO 05 livelihood zone of Goldogob district, based on Link NCA data the proportion of mothers who were either pregnant or breastfeeding was 51.3 %(42.2-60.4% 95% CI). The proportion of children 6-24 months who had ever breast fed was 63.4 %(52.6-73.1 95%CI), while the percentage of children continuing breastfeeding at one year were 68.8 %(36.5-89.4 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household did not reveal a significant association between mothers physiological status and breastfeeding indicators, meaning these indicators were neither risk nor protective factors for child acute malnutrition by GAM (Cf: Annex 2).

In the SO 15-16 livelihood zone of Baidoa, based on Link NCA data the proportion of mothers who were either pregnant or breastfeeding was 65.2 %(60.4-69.7 95%CI). The proportion of children 6-24 months who had ever breastfed 93.0 %(89.3-95.4 95%CI), while children continued breastfeeding at one year was 90.3%(69.6-97.4 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household did not reveal a significant association between mothers physiological status and breastfeeding indicators, meaning these indicators were neither risk nor protective factors for child acute malnutrition by GAM (Cf: Annex 2)

In the SO 13 livelihood zone of Beletweyne, based on Link NCA data, the proportion of mothers who were either pregnant or breastfeeding was 48.3%(39.3-57.4 95%CI). The proportion of children 6-24 months who had ever breast fed were 59.0% (48.5-68.8 95%CI), while children breastfeeding at one year were 60.0 % (36.2-79.9 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household did not reveal a significant statistical association between mothers physiological status and breastfeeding indicators, meaning these indicators were neither risk nor protective factors for child acute malnutrition by GAM (Cf: [Annex 2](#))

As part of the qualitative inquiry in the four livelihood zones, the risk game on breastfeeding practices was played. This revealed perceptions of risk during and after pregnancy, including breastfeeding. Some of the highlighted indicate conflict in their knowledge with the expected risk exposure, as presented in [Table 13](#).

Table 13: Breastfeeding perception of risk

Action	IDP LZ (Kahda) SO-19	Pastoral LZ (Goldogob) SO-05	Agro pastoral LZ (Baidoa)	Riverine LZ (Beltweyne) SO-13	Justification

			SO-15-16		
Breastfeeding on demand	Risky	Risky	Not risky	Not Risky	It affects mother who are breadwinners. Thus taking children with them to work place is risky.
Breastfeeding when a women is pregnant	Risky	Not risky	Not risky	Risky	Mothers perceive that once the mother becomes pregnant the breast milk is not safe
Breastfeeding when a women is hot/from busy work or ill	Risky	Risky	Not risky	Risky	Women engaged in manual labour perceive it risky as they assume that milk is hot and therefore is not safe for the babies.
Eating little during breastfeeding	Not risky	Not risky	Risky	Not risky	The breastmilk supplements the child food thus not risk to the child
Fasting during breastfeeding	Risky	Risky	Not risky	Not Risky	Fasting, mothers report to actively breastfeed, whilst fasting themselves which also leads to increased weakness
Giving holy water to the baby before the age of 6 months	Not risky	Risky	Not risky	Not risky	child is given sweet foods and anzal water, they are likely to grow to be a good child"
Giving water to the baby before the age of 6 months	Risky	Risky	Not risky	Risky	Culturally it is believed the child should be given some water after birth because they are believed to be thirsty.
Giving tea to the baby before the age of 6 months	Risky	Not risky	Not risky	Risky	Breastfeeding makes babies thirsty and babies should be given water in supplement.
Giving family food to the baby	Risky	Risky	Not risky	Risky	Mothers believe there is nothing wrong in giving babies as young as 4 months old solid family food
Giving food to my baby during the fasting period	Risky	Risky	Not risky	Risky	
Leaving a baby with siblings	Risky	Risky	Not risky	Risky	siblings out of school, normally due to lack of school fees, become the primary careers during daytime hours, when mothers look for work
Leaving a baby with grandmother/grandfather	Risky	Risky	Not risky	Risky	common amongst widowed or single mothers who rely on the community and extended family to

					support as mother are engaged in livelihood activities
Raising a voice or slapping a baby when he does something wrong	Not risky	Risky	Risky	Risky	This is part of child discipline.

5.2.3. Complementary feeding practices

The transition from exclusive breastfeeding to family foods, referred to as complementary feeding, should happen for children aged 6 to 23 months. In Kahda, some children are introduced to complementary foods earlier than six months, due to early pregnancies and maternal workload. In the host community however mothers said they breastfed up to 8 months, where complementary food is introduced with food such as milk and food, ideally 'Anjeera', potatoes and fruits which are purchased from the market and may not be present if the family is not able to provide at the given time.

Complementary feeding reportedly varies by maternal source of income, which was most noticeable for SO 19 livelihood women and more so the female headed households, where a mother is required to undertake productive livelihood activities and search for a daily income (Cf:Table 18). This portents challenge to appropriate breastfeeding, childcare practices and interaction with the child.

Reduced meal frequency is known to affect the new IDP population of SO 19 Livelihood zone more than other livelihood zones as a result of the challenges in establishing economic opportunities and community-based relationships to provide assistance.⁷⁷

The focus group discussions indicted that mothers from host community in SO 19 livelihood zone of Kahda district were able to access most of the foods they desired (meat, rice, milk, fruits, pasta, wheat flour, tea with milk)

In SO 05 of Goldogob district, young mothers disclosed that the duration of breastfeeding was short as they were competing with their peers on their total number of pregnancies. These mothers intentionally introduced complementary feeding and bottle feeding as early as 12 – 16 weeks so as to be able to wean the young child early, with the aim of getting pregnant again. Surprisingly, these same mothers reported that they were unable to take adequate care of their children due to their own health related complications during pregnancy or general “weakness,” all which were said to contribute to the children becoming malnourished.

In the SO 15-16 livelihood zone of Baidoa district, breastfeeding period was reduced in villages dependent on farm labour activities i.e. Kormari, Makuda and Bonkai villages as women are heavily engaged in farm activities. In other parts of Baidoa i.e. Wadajir and Makuda, complementary feeding is introduced from 6 -8 months with complementary food i.e. Anjeera (pan cake), potatoes, fruits and other foods consumed by the family. Other foods given to children during this introductory period include powdered milk, tea, goat milk, and other family foods (maize flour, greens, maize and beans). Urban women were believed to prefer bottle feeding, thinking that it is a modern way of childcare or civilization.

In SO 13 of Beltweyne district, breastfeeding mother immediately stops breastfeeding when they discover they are pregnant. Once mothers realize they are pregnant they immediately stop and

⁷⁷ Source: Return and re-integration after displacement,2018. (<https://www.soas.ac.uk/ref-hornresearch/research-papers/file133104.pdf>)

start complementary foods: livestock/powder milk, mashed injera, potato and fruits. Besides interfering with breastfeeding schedules, women identified the long absence from home affecting optimal child feeding practices and interaction with the child.

Minimum meal frequency is defined as the proportion of breastfed and non-breastfed children 6-23.9 months of age who receive solid, semi-solid, or soft foods or milk feeds the minimum number of times or more per their age.⁷⁸ Analysis of NCA data indicated low adequate minimum meal frequency, in the SO 13 livelihood zone of Beltweyne district with 47.9 % (35.7- 60.5 95% CI) of children 6-23.9 months meeting the minimum meal frequency. The prevalence of adequate minimum meal frequency for SO 19 livelihood zone of Kahda was equally low at 50.0 % (39.5-60.5 95% CI). Adequate minimum meal frequency for SO 15-16 livelihood zone of Baidoa district was relatively high at 70.8 % (65.4-75.7 95% CI) while the adequate minimum meal frequency SO 05 livelihood zone of Goldogob district was also relatively high at 62.4 % (47.3-75.4 95% CI) (Cf: [Error! Reference source not found.](#)). Subsequent analyses taking into account anthropometric measurements of children in the household did not reveal a significant association between these indicators, meaning minimum meal frequency was not significantly associated with acute malnutrition and therefore was neither a protective nor a risk factor to child acute malnutrition by GAM.

Acceptable individual dietary diversity with at least four food groups score (IDDS) among children 6-23 months of age, was low across all livelihoods zones. Analysis of Link NCA data for SO 19 livelihood zone of Kahda the acceptable IDDS score was 10.9 % ([7.2-16.1 95% CI). The mean IDDS score was 1.7 [1.6-1.9, 95% CI], on a possible scale of 0-7. This demonstrates that the mean score was far lower than the four recommended food groups. The prevalence of children with zero (0) individual dietary diversity score (IDDS) was 22.0 % (14.2-32.6 95% CI). Subsequent analyses of acceptable IDDS score taking into account anthropometric measurements of children in the household did not show any statistical association meaning children with acceptable IDDS were neither less or more likely to be acutely malnourished. Likewise, statistical analyses of mean IDDS score taking into account anthropometric measurements of children in the household did not reveal a significant statistical association. Statistical analysis of children with zero (0) individual dietary diversity score (IDDS), did not reveal any statistical association meaning children with zero (0) individual dietary diversity score (IDDS) were not more or less likely to be acutely malnourished (Cf: [Error! Reference source not found.](#)).

Analysis of FSNAU data for SO 19 livelihood zone on Kahda district indicated the proportion of children who consumed iron rich food in the last 24hours and seven days were 33.8%(31.8 -35.8 95% CI) and 53.5%(51.7 -55.3 95% CI) respectively. The proportion of children who consumed of vitamin A rich food in the last 24hours and seven days were 60.5 % (58.7 -62.2 95% CI) and 68.2 % (66.5 -69.9 95% CI) respectively. Subsequent statistical analysis taking into account child anthropometric measurement did not reveal any statistical association. This means children who consumed Iron rich food and vitamin A rich food in SO 19 livelihood zone were not more or less likely to be acutely malnourished (Cf:[Error! Reference source not found.](#)).

In the SO 05 livelihood zone of Goldogob the acceptable IDDS score was 6.6 % (3.6-11.9 95%CI). The mean IDDS score was 1.5 (1.3-1.7, 95% CI), on a possible scale of 0-7. This demonstrates that the mean score was far lower than the four recommended food groups. The prevalence of children with zero (0) individual dietary diversity score (IDDS) was 18.2% (12.2-26.3 95% CI). Subsequent analyses of acceptable IDDS score taking into account anthropometric measurements of children

⁷⁸ Source : https://www.who.int/nutrition/databases/infantfeeding/data_source_inclusion_criteria/en/

in the household did not show any statistical association meaning children with acceptable IDDS were neither less or more likely to be acutely malnourished. Likewise, statistical analyses of mean IDDS score taking into account anthropometric measurements of children in the household did not reveal a significant statistical association meaning children with meaning a unit increase in child IDDS score did not lead to an improvement or worsened child acute malnutrition. Statistical analysis of children with zero (0) individual dietary diversity score (IDDS), did not reveal any statistical association meaning children with zero (0) individual dietary diversity score (IDDS) were not more or less likely to be acutely malnourished (Cf: Annex 2)

Analysis of FSNAU data for SO 05 livelihood zone of Goldogob district indicated the proportion of children who consumed iron rich food in the last 24hours and seven days were 32.4%(30.2 - 34.5 95% CI) and 74.9%(72.0-77.6 95% CI) respectively. The proportion of children who consumed of vitamin A rich food in the last 24hours and seven days were 80.3 %(78.4 -82.0 95% CI) and 85.6 %(83.2 -87.7 95% CI) respectively. Subsequent statistical analysis taking into account child anthropometric measurement did not reveal any statistical association. This means children who consumed Iron rich food and vitamin A rich food in SO 05 livelihood zone were not more or less likely to be acutely malnourished (Cf:Annex 3).

In the SO 15-16 livelihood zone of Baidoa children with acceptable IDDS score was 31.8% (27.9-36.1 95%CI). The mean IDDS score was 2.5 (2.2 – 2.9, 95% CI), on a possible scale of 0-7. This demonstrates that the mean score was lower than the four recommended food groups. The proportion of children with zero (0) individual dietary diversity score (IDDS) was 37.7% (25.7 -51.3 95% CI). Subsequent analyses of acceptable IDDS score taking into account anthropometric measurements of children in the household indicated a statistical association meaning children with acceptable IDDS were less likely to be acutely malnourished by cGAM. Statistical analyses of mean IDDS score taking into account anthropometric measurements of children in the household revealed a significant statistical association meaning a unit increase of child's IDDS score led to improvement in child acute malnutrition by WHZ. Statistical analysis of children with zero (0) individual dietary diversity score (IDDS), did not reveal any statistical association meaning children with zero (0) individual dietary diversity score (IDDS) were not more or less likely to be acutely malnourished (Cf: [Annex 2](#)).

Analysis of FSNAU data for SO 15-16 livelihood zone of Baidoa district indicated the proportion of children who consumed iron rich food in the last 24hours and seven days were 13.3%(11.9 - 14.5 95% CI) and 27.0%(25.2 -28.9 95% CI) respectively. The proportion of children who consumed of vitamin A rich food in the last 24hours and seven days were 61.9 %(67.1 -71.0 95% CI) and 80.1 %(78.4 -81.8 95% CI) respectively. Subsequent statistical analysis taking into account child anthropometric measurement revealed a statistical association between children who consumed iron rich food in the last seven days. This means that children who consumed iron rich food in the last seven days were more likely to be acutely malnourished by WHZ. This counter intuitive finding calls for further investigation. Statistical analysis of children who consumed iron rich food in the last 24 hours, children who consumed vitamin A rich food in the last 24 hrs as well as seven days did not reveal any statistical association. This means children who consumed Iron rich food in the last 24 hours and vitamin A rich food both last 24 hours and last seven days in SO 15-16 livelihood zone were not more or less likely to be acutely malnourished (Cf:Annex 3).

In the SO 13 livelihood zone of Beletweyne children with acceptable IDDS score was 11.1% (6.0-19.8 95%CI). The mean IDDS score was 1.8 (1.6 – 2.0, 95% CI), on a possible scale of 0-7. This demonstrates that the mean score was much lower than the four recommended food groups. The proportion of children with zero (0) individual dietary diversity score (IDDS) was 15.0 % (10.1 -

21.6 95% CI). Subsequent analyses of acceptable IDDS score taking into account anthropometric measurements of children in the household did not reveal a statistical association meaning children with acceptable IDDS were not more or less likely to be acutely malnourished. Statistical analyses of mean IDDS score taking into account anthropometric measurements of children in the household revealed a significant statistical association meaning a unit increase of child IDDS led to an improvement of child acute malnutrition by WHZ. Statistical analysis of children with zero (0) individual dietary diversity score (IDDS), did not reveal any statistical association meaning children with zero (0) individual dietary diversity score (IDDS) were not more or less likely to be acutely malnourished (Cf: [Error! Reference source not found.](#))

Analysis of FSNAU data for SO 13 livelihood zone of Beletweyne district indicated the proportion of children who consumed iron rich food in the last 24 hours and seven days were 25.0%(22.4 - 27.7 95% CI) and 37.7%(34.8 - 40.7 95% CI) respectively. The proportion of children who consumed of vitamin A rich food in the last 24 hours and seven days were 86.3 %(84.1 -88.3 95% CI) and 88.8 %(86.8 -90.6 95% CI) respectively. Subsequent statistical analysis taking into account child anthropometric measurement revealed a statistical association between children who consumed iron rich food in the last 24 hours and seven days. This means that children who consumed iron rich food in the last 24 hours and seven days were more likely to be acutely malnourished by WHZ. This counter intuitive finding calls for further investigation. Statistical analysis of children who consumed vitamin A rich food in the last 24 hrs as well as seven days did not reveal any statistical association. This means children who consumed vitamin A rich food both last 24 hours and last seven days in SO 13 livelihood zone were not more or less likely to be acutely malnourished (Cf:[Error! Reference source not found.](#)).

5.3. Food security and livelihoods

Livelihood zones and sources of income

SO 19 Settlement for internally displaced populations, Kahda district

The SO 19 livelihood zone of Kahda District comprises of two main population segments; the urban host community and internally displaced population.⁷⁹ Traditionally pastoral and agro-pastoral communities in this LZ originate from Lower and Middle Shebelle and Bay regions. The host community of Kahda is generally dependent on formal employment,⁸⁰ waged labor or remittances, while IDPs are dependent on casual labor⁸¹, petty trade and humanitarian assistance received from local and international humanitarian organizations. However, according to the Strengthening Nutrition Security in south central Somalia (SNS NCA⁸²), IDPs have been experiencing reduced access to humanitarian support to mitigate food insecurity. The settlements provide limited employment opportunities, especially to women, due to social restrictions as well as their lack of skills. Thus, women face a difficult option to either remain in shelters or to move around Mogadishu in search of rarely available income opportunities, ending up working in

⁷⁹ The agro-pastoral communities used to grow and sell food, although in their current location, IDP settlements, they are forced to purchase all food and non-food requirements.

⁸⁰ Government officials, health staff, teachers and soldiers.

⁸¹ A variety of FGDs highlighted several income generating activities that are undertaken: Running and working in small shops and stalls, Butchery, Tailoring, Loading and unloading, Building and construction work, digging pits, washing and domestic worker, market labour and collecting firewood.

⁸²Source:<https://reliefweb.int/report/somalia/nutritional-causal-analysis-study-south-and-central-somalia-november-2015>.

exploitative casual work. The common concern expressed by a wide range of participants in Kahda is best summed up by one participant:

"The high influx of people fleeing wars all the time leads to competition for the little available opportunities".

Focus group participant, Liqliqato, Kahda

The lack of education by most IDPs may in part be responsible for the struggle, in which these IDPs find themselves. Without the skills to enter the labour market, the loss of farming activity and a lack of alternative skills, they have become entirely dependent on manual labour - an area where the opportunities are limited and competition is high. The focus group discussions revealed that "older" settlers (between 8-12 months in the settlements) have a clearer path in terms of daily activities, benefitting from networks, which supply them with appropriate job opportunities and access to credit. However, more recent settlers do not know where to find jobs and many times they rely on older settlers for food and water. They spend a lot of time roaming, looking for ad hoc opportunities, which eventually adds to their workload.

Income sources in Kahda are not as impacted by seasonality as they are in IDP's original locations in the pastoral setting of Lower and Middle Shebelle. However, participants agreed that "when it rains 'hagaa', casual labour is disrupted. Rain is not welcome here unlike in farming communities; "Here it disrupts our work". This is mainly felt by residents from Liqliqato, where the work at the seaport is hindered during the 'baadh xiran' high winds.

"In the IDP camps, seasons have no impact on our work schedules, every day and every month is the same. During 'hagaa' the seaports don't operate fully because of the monsoon winds, a period called 'baadh xiran'. During this period laborers daily income reduces to about 50% of normal - normally a person may get about 10-12USD in a day, but during 'hagaa' it is common for a laborer to only get 5-6 USD a day."

Community Elder, Liqliqato, Kahda

Similarly, participants noted a little evolution in income activities in Kahda over time, while their income patterns in their original pastoral settings, and were more influenced by increased drought and insecurity. Some households in Kahda still go back to their villages of origin and conduct farming activities and come back to the settlements after the planning, ploughing and harvesting periods. It was also mentioned that some go back to clear bushes in their former farmlands to avoid being taken by other people in the pretext of being non-occupied/non utilized farms.

The Link NCA data analysis for SO 19 livelihood zone of Kahda district indicated that the majority of households depend on waged/casual labour/petty trade, with prevalence of 76.1% (71.9-79.9 95% CI), permanent jobs at 4.8% (3.1-7.4 95% CI) while households with no source of income were 16.2 % (13.1-19.8 95% CI). The percentage of households engaging in agricultural activities (farming) was low at 1.8% (0.8-4.0 95% CI), while those dependent on livestock farming was only 2.7% (1.4-5.1 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household revealed a significant statistical association between household dependent on livestock and child acute malnutrition. This means that children from households dependent on livestock as a source of income were more likely to be acutely malnourished by WHZ and cGAM (Cf: [Error! Reference source not found.](#))

In the same livelihood zone SO-19, analysis of maternal income indicates that 54.5% (49.9-58.9 95% CI) of mothers were engaged in casual labour. The proportion of mothers employed and salaried was 4.2% (2.6-6.7 95% CI), those dependent on livestock were 0.9 % (0.2-3.3 95% CI) while mothers with no income source were 39.8 % (35.4-44.4 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household did not reveal a significant statistical association between these indicators, meaning mothers income source was

neither protective nor risk factors to child acute malnourished (Cf: [Error! Reference source not found.](#))

SO 05 Pastoral livelihood zone, Goldogob district

In SO 05 livelihood zone of Goldogob district, qualitative inquiry revealed the main source of household income is livestock herding, which entails the sale of livestock products, such as milk and ghee. Due to drought that led to livestock deaths, households have been forced to turn to casual labour to compensate any income losses. Such opportunities are usually available around urban centres of Goldogob, as well as along the cross-border trade route in towns like Darussalam. Recurrent drought has resulted in significant reduction in the pasture for the livestock. This entails a dilemma for pastoralists to choose between moving far away from town, where pasture is relatively good but access to water is limited, or come closer to town, where water sources are accessible but pastures are limited. Some pastoral households decide to settle women and their younger children in or near smaller towns like Dar Salaam, Alaale and Goldogob while men take care of the livestock. These towns look therefore bigger partly because of the pastoral household split phenomenon, raising concern of social challenges where mothers end up being bread winners as their husbands are away taking care of the livestock in an environment where opportunities are very few.

In some far villages like Qansahle, where there are no markets to provide casual labour opportunities, the youth engages in cigarette and *khat* chewing. Qansahle is on the transits route between Goldogob and Bursalah and the youth source their addictive substances drivers and passengers plying the route. Shop owners in Qansahle complain of excessive credit requests and general lack of cash in the community.

The drought has also resulted in a shift away from pastoral livelihood activities, as households lose their entire source of income due to livestock deaths, forcing households to turn to IDP settlements and sources of income available there. The contrast between pastoralist and IDP lifestyles represents a huge socio-economic shift that requires a gradual, supported transformation as both men and women lack skills to work in towns and earn a living at the already saturated and competitive markets, such as Alaale.

"Dar salaam is smaller settlement and there are no market and business network, no jobs and income and therefore feeding households is getting difficult"

Focus group participant, Dar salaam, Goldogob

The casual manual labour activities in Goldogob include cutting trees for firewood, charcoal and logging, cleaning *Barkads*, loading and unloading trucks and construction work. However, the government and the local authority's restriction on logging, charcoal burning and firewood collection for commercial reasons has complicated the sourcing of income from this income stream. Changes in government regulation also mean that these income-generating activities are illegal.

"According to government regulation, cutting trees for charcoal and logging is a crime. But the community members have no option but to do it to support their households. Besides being illegal we feel that we do a crime every time we bring charcoal, logs or firewood to the market. One will have to walk for long distances to find a good tree for charcoal burning or logging or firewood. Men sometimes spend one or two nights to accomplish their task. Before there was plenty of trees but because of the drought there are no good trees, plus because of the pastoral drop out, the number of households and people relying on the cutting of trees for their livelihoods has also increased"

Focus group Participant, Xero Jale, Goldogob

Analysis of Link NCA quantitative data for SO 05 livelihood zone of Goldogob district indicated that majority of households depend on livestock farming, at 50.6% (38.9-62.3 95% CI), households with no income source accounted for 35.2 % (24.5-47.7 95% CI). Households dependent on waged labour and petty trade accounted for 21.9 % (14.5-31.7 95% CI), while few households depended on permanent job only at 2.4% (0.8-7.5 95% CI). Households dependent on agriculture (farming) were 3.3% (1.4 -7.6 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household revealed no statistical association between household income indicators; except for households dependent on waged labour/petty trade as a source of income with children from households dependent on waged labour and petty trade marginally more likely to be malnourished by MUAC (p-value <0.1). This indicates that waged labour and petty trade is a weak risk factor to child acute malnutrition (Cf: Annex 2).

Analysis of maternal source of income indicates that's mothers' dependent on livestock and agriculture as a source of income were 52.7% (40.2-64.8 95% CI), casual labour 13.3% (9.1-19.1 95% CI), employed or salaried were 1.7% (0.5-6.3 95% CI) while the proportion of mothers with no source of income were 31.1% (20.4-44.2 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household did not reveal a significant association between these indicators, meaning mothers income sources were neither a risk factor nor protective factor to child acute malnutrition (CF: Annex 2)

SO 15-16 Agro-pastoral livelihood zone, Baidoa district

In the SO 15-16 livelihood zone of Baidoa district, other than the urban livelihood zone in Baidoa town, the surrounding villages are mainly in the Bay agro-pastoral high potential livelihood zone. The main sources of household income include livestock and crop production, business and petty



Photo 1: Sorghum plantation SO 15-16 Livelihood zone of Baidoa

trading, self and waged employment, and casual labour.¹² In addition, a small percentage of households receive remittances from family members and relatives abroad or in other urban areas of Somalia such as Mogadishu, Galkacyo and Bossaso. Baidoa town is the main economic centre for agricultural and livestock markets and is closely linked to rural villages for the supply of these commodities. As a result, households in villages, such as Wadajir, Makuda and Bonkai, were mainly

engaged in agricultural production, while the IDPs living within Wadajir and in Kormari were mainly suppliers of agricultural labour. Few IDPs own lands in the agricultural areas. They were instead seasonally engaged in provision of farm labour for sorghum and other crops (Cf: [Photo 1](#)) The major risk to livelihood for IDPs are the limited economic opportunities in Baidoa, in addition to factors such as insecurity, droughts and conflicts that limit their access to productive agricultural lands in their villages of origin, as well as lack agricultural land.

In the SO 15-16 livelihood of Baidoa district, income generation constraints, mentioned by both IDP and host communities, include access and reliability of existing income opportunities. Most focus group participants lamented about the impact of drought, insecurity and conflicts on their livelihoods.

“Baidoa does not have a port and when drought hits, the markets nearly collapse and most people will be unable to obtain their households needs”

Key informant with community elder Kormari, Baidoa

It was observed that though generally employment opportunities were limited in Baidoa, the situation was made worse by insecurity, low agricultural productivity and trade. With rising food prices due to inflation over the years and the failure of incomes to compensate for the increase in prices of commodities, the urban poor and IDPs dependent on market purchases struggled. As for agro-pastoralists in villages like Makuda and Bonkai, crop failure resulting from droughts was said to severely reduce incomes and food access for poor rural households through a decline in production, decline in agricultural labour opportunities and in trade of cereals. Droughts and diseases were identified as the major risks on livestock, in addition to a limited access to markets. It was observed that as a result of insecurity, traders and brokers (collectors) were not collecting

from the production areas, and as a result, producers were more dependent on the markets in larger settlements such as Baidoa town. Traders said to suffer extortion by militia and Al Shabaab when moving commodities to markets. Access to animal health services was also limited, as there were no input providers in most of the rural areas and available products were of questionable quality.

Better-off and upper middle-income households especially in host communities and rural areas, were reported to have livestock, mainly camel, sheep and goat; however, these animals are usually kept by relatives living in rural areas. In times of stress, livestock can be sold to earn additional income. Livestock sales and their capacity to generate income depend on the season and a volume of animals available for sale. During the dry season, when agro-pastoralists sell more animals to meet their needs, the prices are lowest. As the supply decreases and body condition of animal's increases during the rainy season, the sale price is also higher. Cereal prices are also highest during the rainy season due to poor road infrastructure and difficulties of access in rural areas.

Analysis of Link NCA data for SO 15- 16 indicated the majority of household's in this livelihood zone depend on agriculture(farming) for income at 36.2% (32.8-39.7 95% CI), while the proportion of households dependent on petty trade and casual labour was 26.6 % (23.8-29.7 95% CI). Other common household income sources include livestock: 12.6 % (9.8-16.1 95% CI), permanent job/ salaried position: 6.2 % (4.4-8.5 95% CI), while 21.2 % (11.2-36.3 95% CI) of households reported no income source. Analysis of mothers' income source reveal 40.6% (37.3-43.9 95% CI) of mothers depended on agriculture⁸³ as an income source, while casual labour and petty trade and or firewood accounted for 16.0%(13.0-19.4 95% CI), and those employed/ salaried/merchant traders was 6.2%(4.2-8.9 95% CI). The proportion of women with no income source was 36.8% (33.2-40.4 95%CI) (Cf: [Error! Reference source not found.](#))

Subsequent analyses taking into account anthropometric measurements of children in the household revealed a significant statistical association between these indicators; meaning that children from household dependent on agriculture (farming) as a source of income were more likely to be malnourished by WHZ and combined GAM. This means that agriculture (farming) as a source of income for the household was a risk factor for acute malnutrition, compared to other sources of household income. This could be attributed to cyclic droughts, which affect crop yield reducing household income sources. Meanwhile, subsequent analyses between maternal income source and child malnutrition did not reveal a significant association between these indicators, meaning that maternal income is neither a risk factor nor a protective factor to child acute malnutrition(Cf: Annex 2)

SO 13 Riverine livelihood zone, Beltweyne district

Beltweyne comprises of communities dependent on agro-pastoral livelihood and IDPs who have settled in camps for a long time, about 12 years in the town. There are also pastoral communities in areas as Jawil. The IDPs originated from traditionally farming areas in Lower/Middle Shebelle, Bay and Bakool regions of Somalia. The main sources of income include crop and animal production, petty trade, formal employment, and casual labour.⁸⁴ Some residents also receive remittances from family members who live in other major cities such as Mogadishu, Galkacyo and Bossaso.

⁸³ Livestock, agriculture(farming) or fishing

⁸⁴ A variety of FGDs highlighted several income generating activities that are undertaken: Running and working in small shops and stalls, Butchery, Tailoring, Loading and unloading, Building and construction work, digging pits, washing and domestic worker, market labour and collecting firework.

The Riverine livelihood zone is food surplus most years round despite high prices of inputs, market disruptions from insecurity or flooding, and crop pests. Floods are the main hazard for local farmers. Floodwaters can cost farmers a season's harvest but they are also a benefit as they deposit alluvial soil which improves soil fertility in the long-term.

Analysis of barriers to livelihoods shows that agro-pastoral communities in villages, such as Bacaad and Bacaad Buke, are influenced by drought and subsequent crop failures as well as crop diseases. In addition, it was pointed out that the river water is becoming salty lately, and if that trend continues, it might destroy their livelihoods. Upon detailed enquiry about the reason for water salinity levels, from the community, the majority of them did not know the reason why. It was however mentioned through not scientifically confirmed that high use of river water upstream reduces the quantity of water flow in the river and with high evaporation leads to water being saline. The pastoralist community in Jawil also identified a lack of markets and the insecurity as a result of cross border inter-clan rivalries and the presence of Al-Shabaab in nearby villages. The reliability of existing income sources and the inability of the existing markets to create opportunities for the population especially the youth was pointed out as a major impediment to sustainable income sources.

Whenever, a major shock occurs (like frequent floods), the markets collapse, leaving the majority of the population dependent on humanitarian assistance, notably cash and voucher interventions by NGO's, which represent a temporal source of income (3 months of income). However, as the flooding decimates farm infrastructure and sweeps away tools and machinery including generators and pumps and destroys the canals, it takes the farming communities a long time to fully recover from the aftermath of the floods. The community in Beltweyne mentioned the introduction of mechanized transportation as a threat to their income as it limits manual labour opportunities.

The communities keep livestock, mainly goats and sheep as well as some cattle and camel. This livestock can be sold in time of need during times of major shocks. The sale of livestock was most common during the dry season leading to a market glut therefore decreasing livestock prices. The low animal prices is also attributed to poor livestock body condition. During the rainy season, livestock fetch high prices due to their improved body conditions and low market supply is lower.

The Link NCA quantitative data analysis on household main source of income indicates that 36.5% (26.8 - 47.5 95% CI) of households depended on agriculture (farming), 36.5 % (26.6 - 47.8 95% CI) depended on waged labour and petty trade, 20.1% (12.3 - 31.2 95% CI) depended on livestock, 0.8% (0.2 - 3.5 95% CI) depended on permanent job, while 19.3% (13.1 - 27.6 95% CI) had no source of income. Analysis of mother's source of income shows that 48.1% (37.4 - 58.9 95% CI) of mothers did not have source of income, 27.9 % (18.5 - 39.8 95% CI) depended on casual labour, 22.8 % (14.8 - 33.3 95% CI) depended on livestock, agriculture or fishing, while only 1.0% (0.0-2.9 95%CI) were formally employed (Cf: [Error! Reference source not found.](#))

Subsequent analyses taking into account anthropometric measurements of children in the household revealed a significant statistical association between children from households dependent on agriculture and petty trade as a source of income as children from households dependent on agriculture and petty trade as a source of income were marginally less likely to be malnourished by WHZ or MUAC, respectively (p-value <0.1). This shows that dependence on agriculture and petty trade was a protective factor against child acute malnutrition. Subsequent analyses between maternal income and anthropometric measurements of children in the household did not reveal a significant association between these indicators, meaning maternal

income is neither a risk factor nor a protective factor against child acute malnutrition (Cf: Annex 2).

5.3.1. Population movement (migration and displacement)

Forced eviction constitutes *prima facie* violations of a wide range of internationally recognized human rights and often associated with physical and psychological injuries of those affected with particular impact on women, people living with extreme poverty, children, minorities and other vulnerable groups.⁸⁵

Communities in the SO 19 livelihood zone of Kahda district identified several factors leading to migration; severe drought which destroyed livelihoods forcing movement in search of alternative livelihoods while others migrate due to insecurity and violence in their original homeland. The qualitative inquiry revealed that while migration is part of the culture of these pastoralists; the trend has changed now that they have migrated to the IDP settlements in search of economic opportunities and NGOs support.

The consequences of this migration to Kahda presents a burden on economic opportunities, as well as community-based resources, in turn making the daily struggle harder for both the existing and new IDP population. However, migration was also commented to be beneficial in the sense that people will come in and invest in the local economy while also attributing migration to religious custom. Women in Kahda recognized that migration was necessary for them to be able to raise their families well, due to remittances that men typically send home.

Quantitative Link NCA data analysis for SO 19 livelihood zone indicated that 31.3% (27.7-35.2 95% CI) had resided in their current residence for less than six months. Subsequent analyses taking into account anthropometric measurements of children in the household revealed a significant statistical association with household duration of residence with children from households who had stayed for less than six months in their current residence less likely to be malnourished by, MUAC. (Cf: [Error! Reference source not found.](#)). FSNAU data analysis paint a different picture, with children from households that had resided at their current location longer having a greater WHZ than those who had recently moved in (Cf: Annex 3). This is attributable to several factors; recently arrived IDPs are likely to be very vulnerable, as they have just left their homes (where they may have lived in increasingly poor conditions, e.g., gradually reducing livelihoods). Conversely, IDPs who have stayed at their current location have likely had the time to begin receiving regular humanitarian assistance, source a livelihood, and/or make use of local services, such as health care, etc. The findings between FSNAU and Link NCA analyses could be attributed to agencies beneficiary targeting, where more emphasis is placed on newly arrived households which cushions them against risk factors associated with short duration of residence, paying less attention to households that have stayed longer since they are deemed to be less vulnerable. The reduced or no humanitarian support to households that have stayed longer in their current residence exposes household's various vulnerabilities.

In the SO 05 livelihood zone of Goldogob, migration patterns were significantly different. It was noted that young men migrate to the nearby town of Goldogob or Galkacyo, but do not stay for long due to increased cost of living. Migration of the youth in search of further education was also mentioned but remains a rare practice. The other forms of migration include a movement of pastoralist households in search of water and pasture for their livestock leaving their families behind to fend for themselves.

⁸⁵Source: nrc.no/globalassests/pdf/reports/back-to-square-one-post-eviction-assesment-in-somalia-120118-final.pdf

“If the husband migrates and leaves the family to fend for themselves, then the family will suffer greatly. Children are likely to experience under nutrition due to the lack of food. The mother will not be able to offer proper hygiene since she will struggle to find/access water and finding food for the kids is the biggest challenge”,

Focus group Participant, Alaale, Goldogob

Analysis of Link NCA quantitative data for SO 05 livelihood zone indicated that 16.8% (10.4-25.8 95% CI) of children had lived in their current residence for less than a year, while 23.1% (15.5-33.1, 95% CI) of households had stayed for less than two years]. Subsequent analyses taking into account anthropometric measurements of children in the household revealed a significant statistical association between duration of residence and child acute malnutrition. Children from households who had resided for less than one year and less than two years in their current residence were more likely to be acutely malnourished by WHZ and combined GAM for less than one year residences and combined GAM for children who had resided less than two years (Cf: [Error! Reference source not found.](#)). This means that a short household length of stay less than a year was a risk factor to child acute malnutrition in this livelihood zone.

In the SO 15-16 livelihood zone of Baidoa, seasonal migration in search of opportunities was said to be common in all the four study villages covered by the qualitative inquiry. Most of the urban poor and IDPs move to the surrounding agricultural areas in search of labour opportunities and even the wealthier households move to farm areas to cultivate, harvest and supervise the labour during the rainy season. Similarly, as observed earlier, it was common for the rural populations to migrate seasonally to Baidoa town in search of casual labour opportunities and humanitarian aid when their grain surplus in silos was depleted. They then became dependent on market purchases for food. While these migrations involved men, women left the settlements on a daily basis to do agricultural labour in farms as far as 6 – 10 Km away but returned in the evening. This behaviour has a direct impact on child feeding and mother-child interactions as babies are cared for by their elder siblings, especially girls, or elderly grandparents or neighbours.

Analysis of Link NCA quantitative data for SO 15-16 revealed 10.5% (6.6-16.4 95% CI) of children had stayed in their current residence for less than one year, while 18.7% (12.3-27.4 95% CI) had stayed in their current residence for less than two years. Subsequent analyses taking into account anthropometric measurements of children did not reveal a significant statistical association between household lengths of stay, meaning household length of stay was neither a risk factor nor a protective factor to acute malnutrition in this livelihood zone (Cf: Annex 2)

In the SO 13 livelihood zone of Beltweyne, the majority of recent migrants are fleeing the insecurity in Middle and Lower Shebelle due to an ongoing armed conflict between Somalia National Army (SNA) and Al-Shabaab militia. The other migrants seek high ground, as the floods have uprooted them from their homes or are pastoral drop outs, who have lost all their livestock to recurring drought and inter-clan conflicts, especially at the border with Ethiopia. Seasonal migration patterns were also observed in Beltweyne town, including access to casual labour on construction sites, loading and offloading of vehicles and pit latrine digging. While migration is part of the pastoralist culture, most migrants believe that a residency in an IDP settlement will guarantee them an access to a greater variety of livelihoods while receiving a valued support for schooling and education of their family members, provided by humanitarian organisations.

The qualitative inquiry also revealed that some households sent their children away to live with relatives in Mogadishu in an attempt to offer them access to better education. In Jawil, focus group participants complained about a brain drain as educated children do not return but instead they look for employment opportunities in bigger towns. It was mentioned that a lack of good employment prospects is fuelling a risky migration of the youth via informal channels across the

African continent through the Sahara Desert to Libya, where they fall prey to human traffickers that demand ransom from the family once captured (locally referred to as *tahriib*). This in turn causes a lot of stress to the family, who needs to sell their land, livestock, property, or other assets to offset the demand of the human traffickers.

Analysis of Link NCA quantitative data for SO 13 livelihood zone indicated only 2.4% (0.8-6.4 95% CI) of household had stayed in their current residence for less than a year while 8.5% (4.3-16.1, 95% CI) of households had stayed for less than two years in their current residence. Subsequent analyses taking into account anthropometric measurements of children in the household indicated a significant statistical association between duration of household residence less than one year, meaning children from households who had resided in their current residence for less than a year were more likely to be malnourished by WHZ and cGAM (Cf: [Error! Reference source not found.](#)).

Changes in lifestyle due to displacement (Kahda)

Internally displaced persons from SO 19 livelihood zone of Kahda explained the changes in lifestyle and daily activities, caused by the shift from pastoral and agro-pastoral way of life to urban setting with emotion. While the pastoral/agro pastoral lifestyle for these IDPs was labour intensive, the current workload undertaken in the IDP settlement comes with the additional burden.

“Having to buy everything that you will eat, and what we get at the end of the day is hardly enough to feed our household. We feel burdened and the work we do compared to the income we get is a burden. We continue because we have no choice”.

Focus group Participant, Omar Fiyasko, Kahda

The loss of routine was perceived as particularly very upsetting.

“There were good seasons and bad seasons but we always had something to eat; life was very good. Both men and women were engaged in farming - the four seasons [were demarcated]. ‘Gu’, this season comes after the farmland has been prepared and water is needed for the germination of the seeds. If the ‘gu’ rains come on time the farming community were happy because they expected good harvest which means, there will be plenty to sell and feed the family. The ‘Deyr’ (short rains) begin and again the planting begins. In the new IDP situation, lifestyle has changed from farming to urban life, where the households don’t have a reliable source of income or food. Every day is a new day that you have to struggle to get something to eat throughout the year.”

Key informant participant, Liqliqato, Kahda

As women are no longer involved in agricultural activities, their workload has increased throughout the year as they are continuously engaged in search of income generating activities or food. Analysis of changes in livelihoods, access to food and water, nutrition, health, sanitation, and coping strategies pre- and post- displacement are summarized in [Table 14](#).

Table 14: Differences in Pre-IDP and Current-IDP Livelihoods, Kahda district.

Area	Livelihood Pre-IDP	Current- IDP
Livelihoods	<ul style="list-style-type: none"> ▪ Agricultural and Agro-pastoralists. 	<ul style="list-style-type: none"> ▪ Casual manual labour.
Access to Food	<ul style="list-style-type: none"> ▪ Locally grown on their farms (maize, beans, sorghum, simsim, pawpaw, bananas, mangoes, tomatoes, onions, kale, spinach etc.). ▪ Consumption /selling of produce. 	<ul style="list-style-type: none"> ▪ All household food needs are purchased from the market. ▪ Not able to afford all required food due to low income ▪ Lack of food variety. Mostly depend on maize and beans. ▪ None, or reduced quantities of fruits and vegetables.

Access to Credit	<ul style="list-style-type: none"> ▪ Access to credit was easy due to established reputation and trust. ▪ Businesspeople supported them with credit or lending cash. 	<ul style="list-style-type: none"> ▪ Credit is not easily extended due to IDPs not being known locally to business owners and therefore lack of trust.
Access to Water	<ul style="list-style-type: none"> ▪ Water was freely available from rivers, shallow wells and boreholes. ▪ Households were able to access as much water as required for their needs. 	<ul style="list-style-type: none"> ▪ Water is purchased from nearby boreholes or host households. ▪ Due to financial constraints households doesn't get the level of water required for their household use.
Land Ownership	<ul style="list-style-type: none"> ▪ There was the presence of both farmland and residential areas. ▪ Personal land ownership so there was no fear of eviction. 	<ul style="list-style-type: none"> ▪ In the IDP camps, eviction is a big threat. ▪ IDP households have commonly experienced disruptions of their lives arising from frequent evictions.
Family support	<ul style="list-style-type: none"> ▪ Households were within the neighbourhood of relatives and were able to get people to help with work (both at the farm or home). ▪ During problems community social support was easily available. 	<ul style="list-style-type: none"> ▪ In the IDP camps, relatives are far. ▪ IDP neighbours are equally stressed and may not be in a position to assist.
Firewood	<ul style="list-style-type: none"> ▪ Firewood was collected free of charge from the farms or nearby bushes. 	<ul style="list-style-type: none"> ▪ Kahda being an urban centre, firewood is purchased. ▪ Sometimes women will go far in search of firewood and face violence and sometimes face the risk of rape.

Land access, evictions and safety

The land ownership in SO 19 livelihood zone of Kahda can be categorised as low with about only a third of the population owning a land where they currently live⁸⁶. The majority of land is owned by business people, who do not live in the area and come only to collect rent. The low land ownership has led to a high rate of forced evictions and displacement across various settlements or their surroundings, often with little to no notice (Cf: [Photo 2](#)) The number of persons evicted between 29th and 30th December 2017 represents 23% of the total annual caseload, thus making it the worst single mass eviction incident in 2017⁸. In total, 153,682 individuals were forcefully evicted in Mogadishu from January to December 2017.

This alarming trend is expected to persist due to widespread insecurity, weak protective structures, inadequate land registration and legal framework, as well as the potential for increased commercial and development investments in and around Mogadishu. Such eviction trends would in turn adversely undermine efforts to assist displaced populations accelerate their path to recovery and attain durable solutions.⁸⁷

⁸⁶ Source: https://reliefweb.int/sites/reliefweb.int/files/resources/Somalia_2019_HNO.PDF

⁸⁷ Source: <https://www.nrc.no/globalassets/pdf/reports/back-to-square-one/back-to-square-one-post-eviction-assessment-in-somalia-120118-final.pdf>



Photo 2: Household picking up the pieces of things still useful after demolition in Mogadishu IDP (Courtesy of Back to Square one, January 2018)

Households in the SO 19 livelihood of Kahda IDP are forcefully evicted at the sole discretion of the landowner (Cf: Photo 2). It is important to note that humanitarian agencies in Mogadishu pass through many gate keepers, such as local administration, local sectional administrators and finally the camp leaders, who are mainly the host community members, in order to deliver the assistance to the most vulnerable. A percentage of that support received by each household is shared with the mentioned gate keepers.

“Every time the owner wants to reclaim the land he will just bring a tractor and demolish the settlement to the ground. We are struggling to feed our families; the land is not even on our mind. When we see the tractor come we get worried, otherwise we will not worry because there is no way we can afford to buy land”

Focus group Participants, Shimbiralle, Kahda

The assessment findings indicated no land issues and evictions reported in SO 05 livelihood zone of Goldogob.

The land access in SO 15-16 livelihood zone of Baidoa was comparably better to than SO 19 of Kahda. For example, the land in Kormari IDP camp was allocated by the South West State of Somalia. The IDPs in Kormari reported having paid 1,500 USD in instalments for the land ownership, after which NGOs supported them to establish more permanent structures.

The internally displaced population thus does not face the threat of eviction. The land for farming, however, was not available to the IDPs, although most of them would have liked to engage in farming as they were used to in their original homes. As a result, the IDPs work on farms belonging to the locals in exchange for a wage to provide for their families. Additionally, though less common, rented agricultural land was available in the more productive areas, but was said to be out of reach due to high prices. Other than costs, security was an issue for some areas that were further away as they were occupied by Al Shabaab. It was noted that cultivating such land was considered dangerous.

While the internally displaced population in Baidoa was more organised and comprised of fellow IDPs rather than host community members as was the case in Kahda, it was common for land owners around IDP settlements to encourage the urban poor and IDPs to set up informal structures, locally called “*buush baris*”, so as to hoodwink the NGOs and share the aid with the gatekeeper.

In Beltweyne District, land was indefinitely donated to residents by the owners. Even though they would not own it, they could live there as long as they needed to. Considering that this was a verbal promise, the arrangement could change in the future,

“We are very vulnerable and are at the mercy of the land owner’s family” said one participant during the qualitative inquiry.

Similarly, to Goldogob, there were no cases of evictions reported in Beltweyne.

5.3.2. Market functionality and supply systems

The local commodity production changed over time due to years of multiple shocks including armed conflict, terrorism, multiple taxation, drought and crop failures, flooding’s, locust invasion and the abolition of the Somali shillings, all of which have had an impact on market functioning and access. As a result, goods are coming from further afield, places like Ethiopia, Kenya, South Africa and even out of the continent. This has led to more goods and services compared to 10-12 years ago likewise, the agriculture and livestock market is attracting traders from different parts of the country. The product market availability and their barriers for respective Districts is shown in [Table 15](#).

Table 15: Commodity Market availability

Study zones	Barriers to markets	Effects
SO 19 Kahda	Distance and cost Access to markets was reported to take between 30 - 90 minutes by foot and for some areas needs to be accessed by public transport costing about 3,000 Somali Shillings (\$5.15).	Transport cost expensive to IDPs thus resulting to use of local shops whose commodity prices are high- reducing the commodity basket household can buy.
	Seasonality/climatic conditions; During rainy season road infrastructure is destroyed and during the hot season market is accessed in the morning and evening when the sun is not very hot. During high tides season, <u>ships do not dock</u>	“Commodity prices increase on most goods. Some unscrupulous traders also take advantage of the price increases. When the sea is open, the prices stabilize”, KII, Kahda
	Drought, wars in the agricultural region and road closures due to insecurity	Affect movement of food commodities to the market and increases prices of commodities due to extortion
SO 05 Goldogob	Distance Few available markets in pastoral areas i.e. Alaale, and no means of transport to far markets in Goldogob.	Food prices for ghee, milk among others affected by seasonality. In urban areas of the District, there is a limited access to firewood and charcoal within the rainy months of the year.
	Seasonality and drought Affects market access to food commodities, pasture decline and increase in livestock disease.	The recurrent drought in has resulted in significant reduction in the pasture for the livestock which forced households to move to places where there is pasture and near water points. They send milk to sell in town to obtain money to buy food (maize) and livestock medicine. The sale of milk has led to milk scarcity in pastoral areas. “Darussalam might be closer to the pastoral communities, but milk availability is scarce compared to other bigger towns which are far from the pastoral communities” Traders do not sell vegetables and fruits avoiding stocking them, as they are perishable and as well as community low purchasing power who cannot buy expensive items like fruits.

	Exchange rate against USD, conflict in the agricultural region and road closures due to insecurity	<i>"The product prices have changed significantly. The product prices are controlled by the dollar exchange rate. 10 years ago, USD was exchanging for 710,000 and now USD 100 exchanges for 3.5 million. Prices in the market fluctuate and even the charcoal, goat prices and other local produce are also affected by the dollar exchange rate that affects the market"</i> , FGD, Goldogob
SO 15-16 Baidoa	Baidoa is main markets for sorghum and livestock trade as the area has one of the largest surplus sorghum traded with the neighboring Districts and regions. Livestock traded include camels, cattle, sheep, and goats – Baidoa is a transit route for informal cattle trade to Southern Somalia and Northern Kenya, especially Garissa market.	
	Insecurity and informal charges from Al-Shabaab	In villages further than 20 km from Baidoa, movement of commodities and people to these villages restricted by the presence of Al Shabaab. While it was difficult to quantify the costs, it was established that informal fees were charged on harvests and animals sold by militia such as Al Shabaab. Security roadblocks were said to be major burden restricting movement of commodities and people from rural areas to Baidoa and even on the main roads linking Baidoa to other Districts and to Mogadishu.
	Seasonality and poor road infrastructure	Milk products were available seasonally with camel milk mostly available in the markets followed by cattle milk supplied from the surrounding production areas. During rainy season though there is enough production access to production areas was a challenge due to impassible road network, which increased the number of days imported commodities would reach Baidoa. During dry season, production was lower and migration of pastoralists, the prices of milk increased, sometime doubled. During this period, better-off households purchased milk powder, while the poorer households who could not afford milk increased their consumption of vegetable sauce (<i>dalac bilaash</i>) and cheap meat (<i>goobey</i> or <i>aliyow makare</i>).
	Climate change	<i>"Traditionally the harvests were highest during the Gu season but in recent years, the Deyr season was seen to be better"</i>
SO 13 Beltweyne	In Beltweyne, access to the main market in villages like Domey was the close 15-30 minutes. There were variety of products like fruits and vegetables, maize, sorghum, beans, rice, wheat flour, meat, milk and all non-food items including cloths, electronics, Auto-rickshaw etc. Livestock such as cows, camels, shoats and Donkeys were all available in the market. The main market in Beltweyne is very vibrant and a source of manual labour for all communities in Beltweyne town and surrounding villages.	
	Rainy season and flood effects	<i>"It is practically impossible to go to the market, if you don't know how to swim you will drown in the floods or you will be at risk of crocodiles"</i>
	Poor road network and seasonality	Poor road network during the rainy season limits the access to the market for community members from nearby farming villages to bring in their farm produce. When the roads are impassable farmers, use donkey carts to transport goods to and from the market. The seasonal impacts on markets indicates higher commodity prices during rainy seasons due to road closures and little product reaching the market.
	Unavailability of markets for communities outside Beltweyne town	Residents in villages outside Beltweyne like Bacaad, Bacaadbuke and Jawil don't have a local market in the villages and buy the essentials from the local shops. They only access the market in Beltweyne when selling livestock or farm produce and take public transport.
	Other factors affecting price fluctuations are high seas, armed conflict in the agricultural areas, double taxation by both government and Al-Shabaab militia. According to one community leader <i>"all vehicles that come through Al-Shabaab controlled territory have to pay tax to them, if they don't conform they will</i>	

<p><i>not be granted access and as a result trader will put the prices up and recoup the extra tax from the ordinary customer". This increase in the price of essential commodities mean that the most vulnerable in the community will be hit hardest, further depleting the household's ability to cope making them less resilient to shocks and stresses.</i></p>
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5.3.3. Household food provisioning and saving culture

In the SO 19 livelihoods of Kahda, the saving culture of internally displaced population is low, as the whole income is spent on household needs. The situation is slightly different for the host community engaged in more stable income generating activities, which generate a little buffer for savings. During the qualitative inquiry, participants felt they lacked *"the education and knowledge to save money"*. In addition, participants noted that they did not like to borrow money from neighbours or purchase items at credit as, *"one might not be able to pay it back and this can cause embarrassment and strain the relationship between friends and close neighbours as people fear the baggage that credit brings to one's head"*. In contrast, the residents of Omar Fiyasko commented that they used to get loans in their previous pastoral setting to support agricultural activities, but this was largely based on the level of their production as well as their trustworthiness. The credit facility available to the community members of Kahda is small credit from local shops to the maximum of one dollar while the shop allows further credit only when the previous is paid off.

In the SO 05 livelihood zone of Goldogob, the attitude to debt was different, as households admitted being regularly in debt between 60-300 USD from different traders and relatives. One participants from Qansahle remarked, *"due to the drought and poor market situation almost every household is in debt."*

Goldogob residents expressed concern with the level of debt that they held and the inability to make repayments, commenting,

"There is no definitive repayment plan, but we expect Allah to help us with the repayment. We don't have anything worthy to take to the market to help repay our debts. In instances where households failed to repay the debt, relatives and the wider clan contribute to settle the debt as a way "to avert further violence"

Focus group Participant, Qansahle, Goldogob

Households with the economic ability to save would rather use finances to *"settle in a better place with better services like Goldogob town and Galkacyo"*, while highlighting that for most households it was the lack of income preventing them from saving. If individuals engaged in saving, this was done through the use of mobile phone finance (*'sahil'*) and traditional saving boxes.

The qualitative inquiry showed that no formalised credit facilities exist within both districts, and banks and financial services were felt to be non-existent within the country at large. The residents of Goldogob have higher access to credit by traders in accordance with the individual's daily expected income and is issued with an agreed repayment plan. Also the borrower is expected to become a regular from the credit issuing trader, purchasing all needs from his/her shop.

"Access to credit depends on your income. Traders will consider your income before lending food stuff and goods to you. If they know you have reliable income, they will trust you and give you credit, but if you don't have any source of income they won't trust you with their money. For instance, if your daily income from your casual job is USD 7 - 10, traders will give you USD 10 - 20 with a discussed repayment plan. The other condition is that the person has to become a regular customer and buy all they need from the same trader",

Focus group Participants, Alaale, Goldogob

In the SO 15-16 livelihood zone of Baidoa, most households indicated they were affected by high level of poverty and were struggling to meet their household's needs and had nothing surplus to save. It was noted, however, that agro-pastoral communities would in most cases store some of

their grains in silos and would only sell surplus. As for *hagbad* (merry go round), women especially from Wadajir indicated that they engaged in it, but most of the money was used for household expenditure and not profitable. Formal credit service providers were limited as households only borrowed to meet household needs, rather than to invest.

“Even if one had a desire to invest nobody would lend us such a large sum of money while nobody in rural areas would also take a risk either access to loans for the poor is limited due to low trust (credit)”.

Focus group participants, Makuda, Baidoa

Some focus group participants take credit during the rainy season to purchase food and non-food items, while they pay it back within a year after sales of farm produce. Other households borrow commodities from traders and sell them in their own kiosks, street tables and wheelbarrows, repaying the trader immediately after the sale of the borrowed goods.

In the SO 13 livelihood zone of Beltweyne, among the farming communities, saving takes the form of harvest, which is stored away while households turn to daily wages from manual labour to buy household essentials. The harvest is only used in times of stress as most small-scale farmers do not produce enough to cover the entire year. In some communities, participants engage in *Hagbad* (merry go rounds), however, instead of saving, the money is used for household expenses.

Within the IDP settlements, a small surplus of about 1 or 2 USD is put aside for the next day's household needs, however the said surplus is often used by men to buy 'khat', a leafy twig chewed mainly by men after a long day at work. It was particularly identified as a problem in communities of Bacaad, Domey and Jawil. One participant in a qualitative inquiry noted:

“With the existence of Khat saving will be impossible, as the men will be constantly asking for the little surplus and if denied can lead to domestic problem”

Focus group Participant, Jawil, Beltweyne

Similar to other livelihood zones, there is no micro-finance institution in Beltweyne to offer credit to the population. The only credit option is available at local shops while even those represent a very little amount, based on the individual's expected income. Social networks like friends, families and neighbour can occasionally chip in during the times of hardship. Participants in focus group discussions admitted that they did not like to borrow money as they might not be able to pay back and might foster bad relationship with shopkeepers, friends and family if one fails to pay back. In agro-pastoral communities like Bacaad and Bacaad Buke, food borrowing is common among neighbours while it was returned in the same form and quantity as received the following rainy season. It is worth noting that Somalia communities are Muslims and interest on loans is prohibited according to Muslim teachings and practices

Discussions with community members in the SO 19 livelihood zone of Kahda district indicated that households had challenges with access to food or income to buy food (months of inadequate food provisioning-MHAFFP) in the months of May and September (Cf: [Figure 8](#)), which could be attributed to high tides which affect food importation as few ship could dock. The community highlighted that during these periods, their livelihoods i.e. casual labour which most of the IDPs depend on, is disrupted.

Analysis of Link NCA quantitative data for SO 19 Livelihood zone indicates 42.2 % (38.3 -46.3 95% CI) of households experienced adequate home food access throughout the year. The percentage of households with adequate home food access throughout the year and had stayed more than one year in their current residence were 43.4% (37.9-49.1 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household revealed

a significant statistical association between these indicators. This means that children from households with adequate home food provisioning throughout the year were more likely to be malnourished by WHZ, MUAC and cGAM. Analysis of households with adequate home food provisioning and had stayed in their current residence for more than a year taking into account anthropometric measurements of children indicated significant association. This means that children from households with adequate home food provisioning and children that had stayed in their current residence for more than a year were more likely to be malnourished by WHZ, marginally by MUAC (p-value <0.1) and cGAM. The mean months of adequate home provisioning for households that had been in the area for more than one year within a range of 0 -12, was 10.5 (10.2-10.5) indicating adequate MAHAFP. Subsequent analyses taking into account anthropometric measurements of children in the household indicated a statistical significant association between these indicators, as increased months of adequate food provisioning in the home were associated with lower WHZ scores. (Cf: [Error! Reference source not found.](#)). These findings are not consistent with available knowledge thus require more investigation) It is to be noted that the same pattern of association was not observed in households who stayed in the area for more than one year.

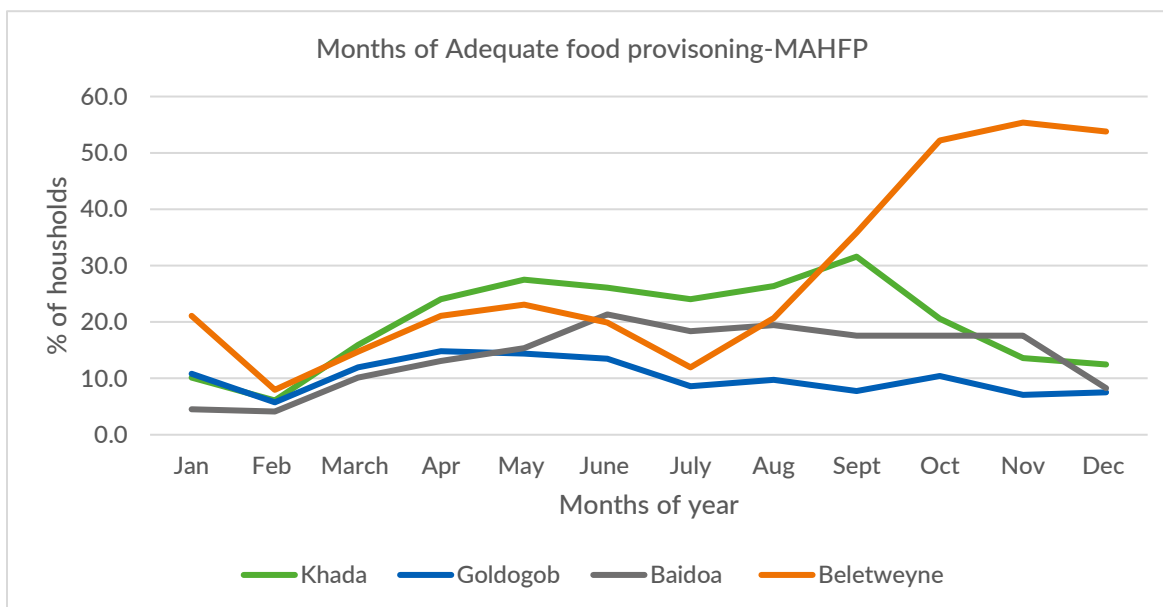


Figure 8: Trends of Months of inadequate food provisioning

In the SO 05 livelihood zone of Goldogob, the food challenges were most severe in March and June (Cf: Figure 8). Analysis of Link NCA quantitative data indicated that 78.1 % (68.6 -85.3 95% CI) of households had adequate home food provisioning throughout the year. The proportion of households who had adequate home food provisioning year-round and had stayed for more than one year in their current residence was 76.6 % (66.2 -84.5 95% CI). Subsequent analyses taking into account anthropometric measurements of children did not reveal a significant statistical association between these indicators, meaning children from households with adequate MAHFP year round in SO 05 livelihood zone were not more or less likely to be acutely malnourished thus MHAFF in this livelihood is neither a risk factor nor protective factor for acute malnutrition. Analysis of mean MHAFF within a range of 0-12, showed a mean of 10.9 (10.7-11.10) indicating adequate MHAFF. Subsequent analyses taking into account anthropometric measurements of children in the household indicated a statistical significant association between these indicators, as increased months of adequate food provisioning in the home were associated with lower WHZ

scores. This was also realized in the households that had stayed more than a year in their current residence. These findings are not consistent with available knowledge thus need for more investigation (Cf:Annex 2[Error! Reference source not found.](#)).

Lack of food or money to buy food in the SO 15-16 livelihood zone of Baidoa was most severe from May to June, and November – December (Cf: [Figure 8](#)) when planted crops are not yet ready and animals were yet to calve. Households were dependent on market purchases for food or more reliant on social support or credit. Analysis of Link NCA quantitative data for SO 15-16 livelihood zone indicated that the proportion of households with adequate food provisioning throughout the year were 36.5% (32.9 -40.2 95% CI) while the proportion of households which reported adequate food provisioning throughout the year and had stayed in their current residence for more than one year were 38.9 % (35.1 -42.9 95% CI).

Subsequent analyses taking into account anthropometric measurements of children in the household revealed a significant statistical association with adequate MHAFF indicators. This meant children from households reporting adequate MAHFP year-round were marginally less likely to be malnourished by MUAC (p-value <0.1). Analysis mean MHAFF within a range of 0-12, showed a mean of 11.1(11.1-11.2) indicating adequate MHAFF. Subsequent analysis taking into account anthropometric measurements of children in the household indicated a statistical association between these indicators, as increased months of adequate food provisioning in the home were associated with improved WHZ scores. This was also similar in households which had stayed for more than one year in their current residence. (Cf: [Annex 2](#)).

In the SO 13 livelihood zone of Beltweyne, households were said to be most food insecure in March to June and October November and December as shown in [Figure 8](#). Analysis of Link NCA quantitative data for SO 13 livelihood zone indicated that 34.9% (25.6 - 45.5 95% CI) of households reported adequate home food provisioning throughout the year. The proportion of households reporting adequate home food provisioning throughout the year and had stayed in their current residence for more than one year was 33.9% (24.5 -41.5 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household revealed a significant statistical association with months of adequate home food provisioning (MAHFP); children from households reporting year-round MAHFP were marginally (p value <0.1) less likely to be acutely malnourished by MUAC. Children from households with residency of more than one year, and had year-round months of adequate home food provisioning, were significantly less likely to be malnourished by MUAC. (Cf:[Annex 2](#)). Analysis of mean MHAFF within a range of 0-12, result was 10.2(10.1-10.4) suggesting adequate MHAFF. Subsequent analyses taking into account anthropometric measurements of children in the household indicated a statistical significant association between these indicators, as increased months of adequate food provisioning in the home were associated with lower WHZ scores. This findings are counter intuitive and needs further investigation (Cf:[Annex 2](#)).

All livelihood zones studied were subject to seasonal influences. In Kahda IDP livelihood zone, other than high tides season and prices changes of commodities in the market, seasonality does not heavily influence livelihood, unlike the agro pastoral livelihood zone of Baidoa, the riverine livelihood zone of Beltweyne and the Pastoral livelihood zone of Goldogob whose main activities highly depend on seasonal variation as shown in the Somalia seasonal calendar (Cf: [Figure 9](#)⁸⁸)

⁸⁸ FEWSNET (Famine Early Warning System)

There is noted climate changes with characteristic failure of the Gu' (main season) and the exceptionally heavy Deyr. This point to the growing impact of climate change in a country.⁸⁹

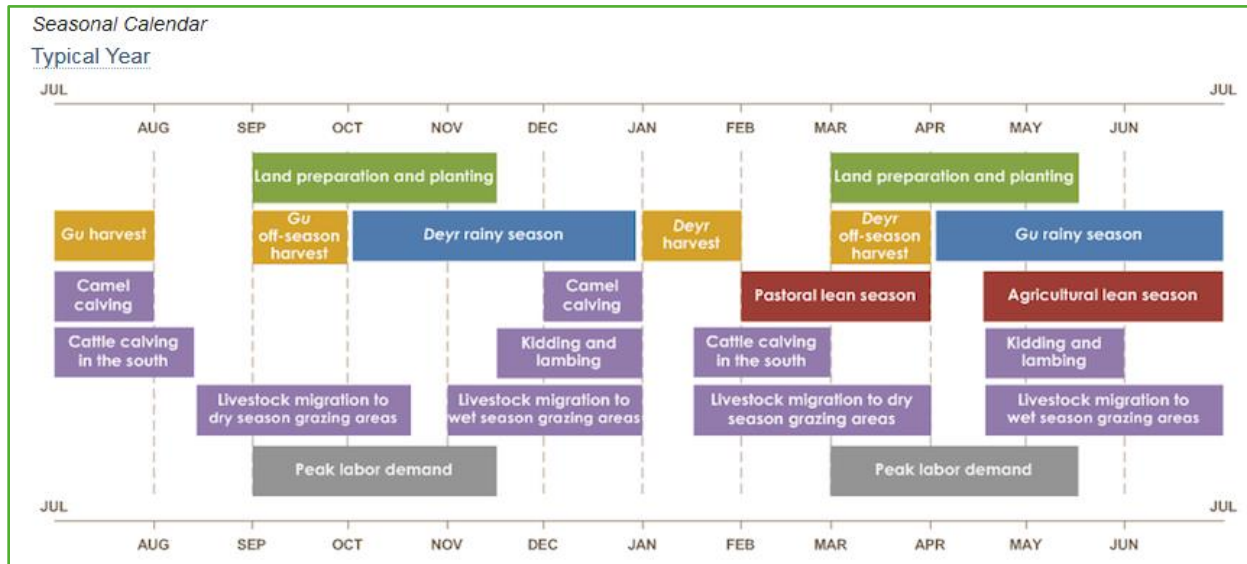


Figure 9: Somalia seasonal calendar (Source: FEWSNET)

5.3.4. Social safety nets

In the SO 19 livelihood zone of Kahda district, participants highlighted the importance and value in the cohesive society in the midst of little or non-existent government support systems. Neighbours and community members support the vulnerable through fundraising efforts in times of crises. Social networks and a sense of security is strengthened/enhanced with household length of stay in the IDP camp. As new IDP's' transition into their new community, success finding economic opportunities is largely linked to success assimilating in social systems and informal support structures.

Analysis of Link NCA quantitative data on social support system for SO 19 indicates 27.5 % (24.1-31.2 95% CI) of households perceived the highest level of social support when presented with four options. Subsequent analyses taking into account anthropometric measurements of children in the household revealed a significant statistical association where children from households perceived higher social support were less likely to be acutely malnourished by MUAC, meaning mothers; perception of higher social support was a protective factor against child acute malnutrition (CF: [Error! Reference source not found.](#)).

The role of social groups, such as merry go round, women and men social groups is not prioritized in Kahda, considering unfavourably high workload and poor living conditions.

“Those who form groups are people with no worries; we have no time to form groups. Who will do the daily labour for us? By the time we finish the manual labour we are tired and cannot go to groups that will not add any value”. Kahda residents remarked that there were calls for group formation by organisations ... when they have programs running when they leave there is no continuity”. The groups that exist to a large extent are associated with political affiliation for the youth which are, “formed by groups aligned to the local administration and have links to national youth forums. Most of the meetings are held in Mogadishu and Kahda residents have no links whatsoever”.

Focus group Participant, Omar Fiyasko, Kahda

⁸⁹ IRN News, <https://www.thenewhumanitarian.org/feature/2019/11/19/Climate-shocks-Somalia-problems>

In the SO 05 livelihood zone of Goldogob, like for SO 19 of Kahda district social support systems for women starts with family. Friends and family are important to the survival of women in the communities, providing numerous sources of help according to the situation being experienced.

Clan and support system in Somalia communities

Across Somalia communities, there is a noted strong community bond and familiarity between community members. Every community member belonged to a clan, usually identified through paternal heritage. The community calls on to clan relations in case of disasters, clashes, weddings and collecting family charity.

Women and social support systems are rooted in close personal relationships with friends and family providing tangible help and/or encouragement and support. Often, family members babysit sick children to allow women to search for work; others send financial resources if able. When family and close friends are not able to provide the assistance and support required, social systems extend to neighbours and even, “*the shop where we are customers. Then if all else fails, we ask the elder community members for help; they in turn fundraise.*” This illustrates the wide scope of the social support systems women have access to, although they are more comfortable requesting family members for assistance.

Analysis of Link NCA quantitative data on social support system for SO 05 indicated that 63.2% (50.8 - 74.2 95% CI) of women perceived highest external support. Subsequent analyses taking into account anthropometric measurements of children in the household did not reveal a significant statistical association between these indicators; perceived external social support was neither a risk factor nor a protective factor in SO 05 livelihood zone. (CF:[Annex 2](#)).

In the SO 15-16 livelihood zone of Baidoa, social networks and clan relations increase resilience in times of crisis. The clan system is patrilineal and hierarchically structured. It can be differentiated into several levels; clan family, and sub-clan⁹⁰. The clan was said to provide not only protection, but also informal support, especially during crisis. The dominant clan in Baidoa is the *Rahweyn*, which controls the economic and political aspects in Baidoa. They assist fellow clan members by sharing food and other essential commodities. In case of tragedy, they fundraise and/or identify work opportunities for the affected family. Clansmen who own businesses typically hire other clan members as employees, particularly for unskilled labour activities. Respondents highlighted the importance of the relationships between rural and urban communities and the consequences of reduced business interactions between these two communities. For example, in the rainy season when there is decreased trade in rural areas, urban poor households and IDPs suffered lowered incomes and reduced purchasing power.

Poor households sometimes receive food and cash in the form of gifts (*Sadaqa*⁹⁰ and *Zakaat*⁹¹) from wealthier members of community or members of the same clan. It was however noted that in the IDP camps and rural communities, have few rich clan members thus the social support system was weak – “*two naked people cannot carry one another*” an elder said, meaning that if one has nothing much, they are unable to support another. The IDP’s had well established networks for accessing social support and incomes, considering that they have been in Baidoa for as five years and above. IDPs in Makuda who had arrived from Mogadishu or were displaced from rural areas by recent

⁹⁰ Support given to less fortunate members of the community by the rich or well to do members of the community. This is given anytime and any value.

⁹¹ Support given to the less fortunate members of the community. This is based on 2.5% of annual income.

drought and conflict were said to be more vulnerable, as integrating into social networks takes time.

Analysis of Link NCA quantitative data for SO 15-16 indicated that 17.6 % (15.5 -19.9 95% CI) of mother perceived lowest social support. Subsequent analyses taking into account anthropometric measurements of children in the household did not reveal a significant statistical association between these indicators; perceived external social support was neither a risk factor nor a protective factor in SO 05 livelihood zone (Cf: [Annex 2](#))

In the SO 15-16 livelihood zone of Baidoa, households receiving remittances from relatives and family members abroad or in country (other parts of Somalia) is an important source of social support. In this livelihood households receiving remittances are considered better off. It was mentioned that household members abroad send above USD 100 per month, while those in other parts in Somalia remits USD 30 – 50 per month.

In the SO 13 livelihood zone of Beltweyne district, community members reported family as the first line of support. Community solidarity is extended to new arrivals IDPs, including advice and support during the transition, which is similar in Kahda and Baidoa.

Analysis of Link NCA quantitative data on perceived highest social support for SO 13 livelihood zone of Beletweyne indicated that 8.6 % (5.2 -14.1 95% CI) of households in Beltweyne perceived lowest external support. Subsequent analyses taking into account anthropometric measurements of children in the household did not reveal any significant statistical association between maternal perceived social supports highest and child acute malnutrition by GAM. This means children from households with perceived highest social support were not more or less likely to be acutely malnourished. (Cf:[Annex 2](#)).

5.3.5. Household coping strategies

Qualitative discussion with the IDP community from SO 19 livelihood zone of Kahda district revealed that the IDP'S' employ more coping mechanisms than the host community. This is because the host community can sell small goats and chickens that they raise on the minimal land available as well as proceeds from their businesses. On the other hand, IDP populations resort to accessing credit from small shops, borrowing from the community, or in the worst-case scenario, sleeping without food. The host community have access to wider networks and resources marginally reducing employing coping strategies. Analysis of Link NCA data for coping strategies employed by households among the SO 19 livelihood zone of Kahda district indicates that households employed a number of coping mechanisms, including consumption of cheaper or less preferred food three to seven days were 28.5 % (25.6-31.7 95% CI) out of which 31.6 % (24.0 - 40.3 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children revealed a significant statistical association with children from these households more likely to be malnourished by WHZ. Analysis did not however show any significant association between female headed households consumed cheaper and less preferred food (Cf:[Error! Reference source not found.](#)).

The proportion of households that borrowed food three to seven days were 13.5 % (10.7 – 16.9 95% CI) out of which 17.8 % (11.6 – 26.4 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children revealed a significant statistical association with children from households who borrowed food being more likely to be acutely malnourished by WHZ and CGAM. There was also significant statistical association

between female headed households who borrowed food with their children being more likely to be acutely malnourished by WHZ, MUAC and cGAM (Cf: [Error! Reference source not found.](#)).

The proportion of households who reduced portion size of meals three to seven days were 11.4 % (8.8-14.7 95% CI) out of which 12.6 % (7.0 - 21.8 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children revealed a significant statistical association with children from these households being more likely to be malnourished by WHZ. There was however no statistical association for female headed households who reduced the portion of meals (Cf:[Annex 2](#)).

The proportion of households who gave food to children only and not adults for three to seven days were 17.4 % (14.3-21.0 95% CI) out of which 17.8 % (11.2-27.1 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children did not reveal a significant statistical association between households which gave meals to children only. There was however a statistical association between female headed households who gave meals to children only with their children being more likely to be acutely malnourished by MUAC (Cf:[Error! Reference source not found.](#)).

The proportion of households who reduced the number of meals three to seven days 23.9 % (20.5 - 27.7 95% CI) out of which 25.3 % (18.3 - 33.9 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children did not reveal any significant statistical association with household which reduced number of meals as well as female headed households who reduced number of meals. This means children from households which reduced the number of means were not more or less likely to be acutely malnourished (Cf:[Error! Reference source not found.](#)).

The mean reduced coping strategy index (rCSI) on a possible range of 0-56 for SO 19 Livelihood zone was for 10.3 (9.7 - 11). This demonstrates that the mean rCSI score was far lower, Subsequent analyses taking into account anthropometric measurements of children in the household indicated a statistical significant association between these indicators, as increased rCSI in the home were associated with lower WHZ scores. This was also true for female headed households which employed reduced coping strategy mechanism. (Cf:[Error! Reference source not found.](#)).

Other coping mechanisms employed by households and their proportions included: collection of food from the wild for three to seven days were 3.8% (2.3-6.1 95% CI) out of which 8.1% (3.5 - 17.7 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children revealed a significant statistical association with female headed households who collected wild plants or food to eat, with children from these households being more likely to be acutely malnourished by WHZ, MUAC and cGAM (Cf: [Annex 2](#)).

The proportion of households who sent women and or children and other household members to work for food three to seven days were 18.0 % (15.1-21.3 95% CI) out of which 12.6 % (8.0 -19.4 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children revealed a significant statistical association with female headed households who sent children and or other households members to work for food with children from these households being more likely to be malnourished by MUAC and cGAM (Cf: [Error! Reference source not found.](#)).

The proportion of households who ate stored food three to seven days were 4.5% (2.8-7.3 95% CI) out of which 4.0 % (1.2 - 12.2 95% CI) were female headed households. Subsequent analysis

taking into account anthropometric measurements of children revealed a marginal statistical association with households who ate stored food with children from these households being more likely to be malnourished by MUAC (Cf:Annex 2).

The proportion of households who purchased low quality food in the market three to seven days were 32.1% (28.5-35.9 95% CI) out of which 24.1 % (18.2 - 31.3 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children revealed a statistical association with households who purchased low quality food in the market with children from these households being more likely to be malnourished by MUAC and cGAM. The findings also indicated a marginal statistical association (P-Value <0.1) between female headed households who purchased low quality food in the market with children from these households being less likely to be acutely malnourished by WHZ (Cf:Annex 2).

The proportion of households who bought food on credit three to seven days were 4.2% (2.6 -6.5 95% CI) out of which 4.6 % (1.9 - 11.0 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children did not revealed any statistical association with households who bought food on credit as well as female headed household. This meant that children from households purchasing food on credit and being a female headed households were not more or less likely to be acutely malnourished (Cf: Annex 3).

In the SO 05 livelihood zone of Goldogob, qualitative discussion with the community revealed some households sell livestock when stressed, i.e. goats, while some sell milk from their livestock and reduce meal frequency, sometimes to no meals per day.

“When there is no income for food, or NGO food programmes stop food or cash distribution, many households especially the poor and pastoral dropouts remain extremely food insecure. During such times, household practice extreme coping mechanisms such as skipping meals and burning charcoal and cutting trees to earn income. Some households borrow food from relatives, some go to the trader to request for more foodstuff on credit. Households generally reduce the number of meals and the portion of the meal too. Pastoral dropouts and poor families, especially women headed households, are more the more affected than the village host communities who rely on petty trades”,

Key informant, Qansahle, Goldogob

Other coping mechanisms reported in SO 05 livelihood zone involved sending family members, especially younger children, to live with relatives. The primary aim of this is to ensure that the children have access to better nutritional intake, wider dietary diversity, and/or increased access to education. Boys are typically sent to distant relatives, while girls are more likely to be sent to close relatives, such as a stepmother, grandmother or aunts, as girls were considered fragile/weak and needed more close attention. This practice was common amongst widowed or single mothers who rely on the community and extended family to support them in the absence of a husband.

Quantitative analysis of link NCA data SO 05 revealed that households employed a number of coping mechanisms, including consumption of cheaper or less preferred food three to seven days were 14.3% (8.2 -23.9 95% CI) out of which 22.8 % (11.7 - 29.7 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children revealed a marginal statistical association (P-Value <0.1) with children from these households being more likely to be malnourished by MUAC. Analysis did not however show any significant association between female headed households who consumed cheaper and less preferred food and child acute malnutrition (Cf:[Error! Reference source not found.](#)).

The proportion of households that borrowed food three to seven days were 12.6 % (6.8 – 22.3 95% CI) out of which 20.3 % (10.9 – 34.6 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children revealed a significant statistical association with children from households who borrowed food as well as female headed households who borrowed food being more likely to be acutely malnourished by MUAC (Cf: [Annex 2](#)).

The proportion of households who reduced portion size of meals three to seven days were 18.8 % (11.4-29.4 95% CI) out of which 28.2 % (16.7 – 43.2 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children did not revealed any significant statistical association with child acute malnutrition meaning children from households who reduced portion size of meals as well as female headed were neither more or less likely to be acutely malnourished. (Cf:[Annex 2](#)).

The proportion of households who gave food to children only and not adults for three to seven days were 13.8 % (8.3 - 22.1 95% CI) out of which 21.8 % (13.2-33.8 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children did revealed a significant statistical association between households which gave meals to children only as well as female headed households who gave meals to children only. This means that children from households who gave meals to children only as well as female headed households who gave meals to children only were more likely to be malnourished by MUAC and cGAM. The findings also showed marginal statistical significance (p-value <0.1) with children from these households more likely to be malnourished by WHZ. (Cf:[Error! Reference source not found.](#)).

The proportion of households who reduced the number of meals three to seven days 17.6 % (11.1 – 26.7 95% CI) out of which 22.8 % (13.9 – 35.0 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children did not reveal any significant statistical association with household which reduced number of meals as well as female headed households who reduced number of meals. This means children from households which reduced the number of means were not more or less likely to be acutely malnourished (Cf:[Annex 2](#)).

The mean reduced coping strategy index (rCSI) on a possible range of 0-56 for SO 05 Livelihood zone was for 6.6 (5.8 – 7.4). This demonstrates that the mean RCSI score was far lower, with subsequent analysis in relations to child acute malnutrition indicated no statistical association meaning a unit increase or decrease of reduced coping strategy will not lead to increase or decrease of child acute malnutrition. (Cf:[Error! Reference source not found.](#)).

Other coping mechanisms employed by households and their proportions included: collection of food from the wild for three to seven days were 9.2% (3.9-20.0 95% CI) out of which 12.4% (5.0 – 27.7 95% CI) were female-headed households. Subsequent analysis taking into account anthropometric measurements of children did not reveal a significant statistical association. This means that children from households which collected food from wild were not more or less likely to be acutely malnourished (Cf:[Error! Reference source not found.](#)).

The proportion of households who sent women and or children and other household members to work for food three to seven days were 15.4 % (8.5-26.3 95% CI) out of which 20.9 % (10.5 -37.3 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children revealed a significant statistical association with these households as well as female-headed households who sent children and or other household members to work for food. Children from these households were more likely to be acutely malnourished by MUAC.

There was noted marginal statistical significance (p -value <0.1) with households which sent children and or other household members to work for food with children from these households being more likely to be malnourished by MUAC (Cf:[Error! Reference source not found.](#)).

The proportion of households who ate stored food three to seven days were 11.3% (5.6 -21.3 95% CI) out of which 12.4 % (5.2 - 26.8 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children revealed a statistical association with households who ate stored food with children from these households being more likely to be malnourished by MUAC. Findings also indicated a marginal statistical significance with female headed households who ate stored food with children from these households being more likely to be malnourished by MUAC (Cf:[Annex 2](#)).

The proportion of households who purchased low quality food in the market three to seven days were 19.1% (11.6-29.7 95% CI) out of which 32.8 % (19.1 - 50.3 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children revealed a statistical association with households who purchased low quality food in the market with children from these households being more likely to be malnourished by MUAC. (Cf:[Error! Reference source not found.](#)).

The proportion of households who bought food on credit three to seven days were 18.7% (12.5 - 27.1 95% CI) out of which 27.4 % (16.9 - 41.2 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children did not revealed any statistical association with households who bought food on credit as well as female-headed household. This meant that children from households purchasing food on credit and being a female headed households were not more or less likely to be acutely malnourished (Cf: [Annex 2](#))

In the SO 15-16 livelihood zone of Baidoa district, household resilience had been eroded due to compounding issues, including droughts, insecurity, increasing commodity prices and displacements. The most common coping methods include skipping meals, multiple household members engaging in casual labour and other activities, migration in search of income earning opportunities or humanitarian aid support, borrowing and credit from personal relationships or businessmen, increased engagement in charcoal and firewood collection, quarrying, and increased reliance on gifts, *Sadaqa*⁹⁰ and *Zakaat*⁹¹.

Focus group participants' highlighted the attraction of people by humanitarian aid to Baidoa, some seeking livelihood at the IDP's' camps. NGO assistance is believed to strengthen household resilience. In the absence of NGO's, as was true in Makuda and Bonkai, respondents highlighted that many households, especially the poor which include agro-pastoral dropouts whose livestock reduced or died due to subsequent drought as well as subsequent crop failure due to lack of rains remain extremely food insecure and vulnerable.

Analysis of Link NCA quantitative data for SO 15-16 of Baidoa on household coping mechanisms revealed revealed that households employed a number of coping mechanisms, including consumption of cheaper or less preferred food three to seven days were 24.3% (21.5 - 27.3 95% CI) out of which 41.4 % (35.7 - 47.3 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children revealed a marginal statistical association (P -Value <0.1) with children from these households being less likely to be acutely malnourished by WHZ. Analysis did not however show any significant association between female headed households who consumed cheaper and less preferred food and child acute malnutrition (Cf:[Annex 2](#)).

The proportion of households that borrowed food three to seven days were 14.2 % (11.9 – 16.9 95% CI out of which 30.0 % (23.1 – 38.2 95% CI) were female-headed households. Subsequent analysis taking into account anthropometric measurements of children revealed a significant statistical association by MUAC and marginal association (P-Value <0.1) by WHZ. This means children from households, which borrowed food three to seven days were more likely to be acutely malnourished by MUAC and marginally less likely to be malnourished by WHZ. This counterintuitive relationship needs further investigation. The finding further indicated that children from female headed households who borrowed food were marginally more likely to be acutely malnourished by cGAM (Cf:[Error! Reference source not found.](#)).

The proportion of households who reduced portion size of meals three to seven days were 17.9 % (15.1-21.0 95% CI) out of which 24.1 % (17.0 – 32.9 95% CI) were female-headed households. Subsequent analysis taking into account anthropometric measurements of children indicated marginal statistical significance (p-value <0.1) between households who reduced portion of meals with child acute malnutrition meaning children from households who reduced portion size of meals were marginally more likely to be acutely malnourished by MUAC. There was however no statistical significance between female headed households who reduced portion of meals (Cf:[Annex 2](#)).

The proportion of households who gave food to children only and not adults for three to seven days were 20.1 % (17.0 – 23.5 95% CI) out of which 22.6 % (14.8-32.9 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children revealed a significant statistical association between households, which gave meals to children only. This means that children from households who gave meals to children only were more likely to be acutely malnourished by MUAC. The findings did not show statistical association between children from female headed households who gave meals to children only and child acute malnutrition (Cf:[Error! Reference source not found.](#)).

The proportion of households who reduced the number of meals three to seven days 13.4 % (10.9 – 16.3 95% CI) out of which 13.5 % (7.2 – 24.1 95% CI) were female-headed households. Subsequent analysis taking into account anthropometric measurements of children did not reveal any significant statistical association with household, which reduced number of meals as well as female headed households who reduced number of meals. This means children from households which reduced the number of means were not more or less likely to be acutely malnourished (Cf:[Annex 2](#)).

The mean reduced coping strategy index (rCSI) on a possible range of 0-56 for SO 15-16 livelihood zone was for 10.6 (9.9 – 11.3). This demonstrates that the mean rCSI score was far lower, with subsequent analysis in relations to child acute malnutrition with rCSI meaning Subsequent analyses taking into account anthropometric measurements of children in the household indicated a marginal statistical association (P-value <0.1) between these indicators, as increased rCSI in the home were associated with lower MUAC scores. This was also true to female headed households which employed rCSI This counter intuitive findings needs more investigation (Cf:[Error! Reference source not found.](#)).

Other coping mechanisms employed by households and their proportions included: collection of food from the wild for three to seven days were 23.1% (20.3-26.1 95% CI) out of which 33.8% (25.5 – 43.4 95% CI) were female-headed households. Subsequent analysis taking into account anthropometric measurements of children revealed a significant statistical association between these indicators. This means that children from households, which collected food from wild were more likely to be acutely malnourished by MUAC. The findings also showed that children from

female headed households who collected wild plants and food were more likely to be acutely malnourished by cGAM (Cf:[Error! Reference source not found.](#)).

The proportion of households who sent women and or children and other household members to work for food three to seven days were 6.7 %(4.9-9.1 95% CI) out of which 12.8 %(7.5 -20.9 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children revealed a marginal statistical association (P-Value <0.1) with this indicator. This means that children from households who sent women or children and or other household members to work for food were less likely to be acutely malnourished by WHZ. There was no statistical association found between female headed households who sent children and other household members to work for food and child acute malnutrition (Cf: [Error! Reference source not found.](#)).

The proportion of households who ate stored food three to seven days were 32.7% (30.1-35.4 95% CI) out of which 43.6%(34.9 – 52.7 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children did not reveal any statistical association. This means children from households who ate stored food were not more nor less likely to be acutely malnourished (Cf: [Error! Reference source not found.](#))

The proportion of households who purchased low quality food in the market three to seven days were 29.6% (26.9-32.5 95% CI) out of which 42.9 %(37.0 – 49.0 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children did not reveal any statistical association. This means that children from households which purchased low quality food from the market were not more or less likely to be acutely malnourished (Cf:[Annex 2](#)).

The proportion of households who bought food on credit three to seven days were 28.7% (26.1 - 31.4 95% CI) out of which 45.9 %(39.3 – 52.3 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children revealed a statistical association with households who bought food on credit. This meant that children from household, which purchased food on credit were more marginally more likely to be acutely malnourished by MUAC. Further analysis did not show any significant association between child acute malnutrition and female headed households who bought food on credit meaning children from these households were not not more or less likely to be acutely malnourished (Cf: [Annex 2](#)).

In the SO 13 livelihood zone of Beletweyne, shocks reported were drought, frequent floods, increasing commodity prices, locust invasions, armed conflict and insecurity. The community reported feeling their resilience was tested to extremes in the face of these compounding and insurmountable challenges. During the harvest season, residents in farming communities stock their harvest in silos and look for manual labour in the town. Wages from manual labour are used to meet family needs and for discretionary spending. At the household level, floods present challenges in food availability, where household skip one or two meals and youth members of community will look for work outside the village in bigger cities like Mogadishu, Galkacyo and Bossaso and send money home. Some households borrow from local shops, friends, family and neighbours. The agro pastoral community sells their small holdings of livestock, such as goats, sheep, cows, and/or camels, to offset stress.

“Sometimes I will go look for work to no avail, I come back home with no money to spend or buy food stuff for the children. If I find something from the neighbour or friends and family good, otherwise I will put the fire on and pretend to cook until the children fall asleep”.

Focus group Participants, Bacaad buke, Beltweyne

Analysis of Link NCA quantitative data from SO 13 of riverine livelihood zone of Beltweyne district revealed that households employed a number of coping mechanisms, including consumption of cheaper or less preferred food three to seven days were 4.3%(2.0 -8.8 95% CI) out of which 3.8 %(1.2 – 11.4 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children revealed a statistical association with children from these households being more likely to be malnourished by MUAC. Analysis did not however show any significant association between female headed households who consumed cheaper and less preferred food and child acute malnutrition (Cf: [Error! Reference source not found.](#)).

The proportion of households that borrowed food three to seven days were 22.5 %(13.7 – 34.8 95% CI) out of which 13.4 %(7.9 – 21.7 95% CI) were female-headed households. Subsequent analysis taking into account anthropometric measurements of children revealed no significant statistical association with children from households who borrowed food as well as female-headed households who borrowed food. This means children from households borrowing food as well as female headed households borrowing food are neither more likely or less likely to be acutely malnourished (Cf: [Error! Reference source not found.](#)).

The proportion of households who reduced portion size of meals three to seven days were 12.6 %(7.0 -21.7 95% CI) out of which 10.3 %(5.5 – 18.5 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children revealed marginal significant statistical association (p-value <0.1) with child acute malnutrition meaning children from households who reduced portion size of meals were less likely to be acutely malnourished by WHZ. There was however no statistical association between child acute malnutrition and female headed households who reduced portion size meaning children from female headed households who reduced portion size were neither more or less likely to be acutely malnourished. (Cf: [Error! Reference source not found.](#)).

The proportion of households who gave food to children only for three to seven days were 7.6 %(3.8 -14.6 95% CI) out of which 4.2 %(1.7 – 10.1 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children revealed a significant statistical association meaning children from households who gave food to children only were more likely to be acutely malnourished by MUAC. There was however no statistical association between child acute malnutrition and female headed households who gave food to children only meaning children from female headed households who gave food to children only were neither more or less likely to be acutely malnourished. (Cf: [Annex 2](#)).

The proportion of households who reduced the number of meals three to seven days 11.4 %(6.3 – 19.7 95% CI) out of which 12.2 %(6.4 – 22.2 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children revealed a marginal significant statistical association (p-value <0.1) with household which reduced number of meals with children from these households being marginally more likely to be malnourished by MUAC. There was also noted statistical association between female-headed households who reduced number of meals. This means children from female-headed households which reduced the number of meals were more likely to be acutely malnourished by WHZ and cGAM (Cf: [Annex 2](#)).

The mean reduced coping strategy index (rCSI) on a possible range of 0-56 for SO 13 Livelihood zone was for 9.1 (8.6 – 9.5). This demonstrates that the mean rCSI score was far lower, with subsequent analyses taking into account anthropometric measurements of children in the household indicated a statistical significant association between these indicators, as increased rCSI in the home were associated with lower WHZ scores. Subsequent analysis of mean rCSI

among female headed households in relations to child acute malnutrition did not show any statistical association (Cf: [Error! Reference source not found.](#)).

Other coping mechanisms employed by households and their proportions included: collection of food from the wild for three to seven days were 4.6% (2.3-8.9 95% CI) out of which 5.7% (2.6 – 12.2 95% CI) were female-headed households. Subsequent analysis taking into account anthropometric measurements of children did not reveal a significant statistical association. This means that children from households which collected food from wild as well as children from female headed households who collected food from wild were not more or less likely to be acutely malnourished (Cf: [Error! Reference source not found.](#)).

The proportion of households who sent women and or children and other household members to work for food three to seven days were 3.6 % (2.0-6.6 95% CI) out of which 5.0 % (2.2 -10.7 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children did not reveal a significant statistical association with households who sent children and or other households members to work for food as well as female-headed households who sent children and or other households members to work for food. This means children from these households were not more or less likely to be acutely malnourished (Cf: [Annex 2](#)).

The proportion of households who ate stored food three to seven days were 8.5% (4.3 -16.7 95% CI) out of which 4.6 % (1.5 – 13.3 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children did not reveal any statistical association with households who ate stored food as well as female-headed households who ate stored food. This means children from households who ate stored food and female headed households who ate stored food were not more or less likely to be acutely malnourished (Cf: [Annex 2](#)).

The proportion of households who purchased low quality food in the market three to seven days were 11.4% (5.9 -20.7 95% CI) out of which 7.3 % (3.8 – 13.5 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children revealed a statistical association with households who purchased low quality food in the market with children from these households being more likely to be malnourished by MUAC. Analysis of female-headed households who purchased low quality food in the market taking into account anthropometric measurement did not reveal a statistical association. This means that children from female headed households who purchased low quality food in the market were not more or less likely to be acutely malnourished (Cf: [Error! Reference source not found.](#)).

The proportion of households who bought food on credit three to seven days were 28.8% (19.7 - 40.0 95% CI) out of which 20.2 % (12.9 – 30.3 95% CI) were female headed households. Subsequent analysis taking into account anthropometric measurements of children did not revealed any statistical association with households who bought food on credit as well as female-headed household. This meant that children from households purchasing food on credit and being a female headed households were not more or less likely to be acutely malnourished (Cf: [Annex 2](#))

5.4. Water, Sanitation and Hygiene

Water access and availability

The population in the SO 19 livelihood zone of Kahda district had access to different types of water sources, depending of their location. The residents of Liqliqato and Omar Fiyasko are served by private boreholes, where water is sold for 1,000 Sh.so (equivalent of 1.72 USD) for 20 litres.

Public boreholes are also available, and water from these sources is free of charge. However, the use of these free water sources comes with its challenges, such as long queues and rationing of maximum 40 litres per day, irrespective of a household size. This quantity is usually considered insufficient to meet household's daily needs. In Abadir, the community is served by three privately managed boreholes, which reduces queues and ensures water availability year-round, but the water is costly for some households. If the water cannot be purchased daily due to the lack of funds, borehole managers allow households to collect water up to two days, after which they need to clear the debt or their access to water is denied.

During the rainy seasons (March-May, October-December), households collect rainwater and use it for clothes washing. Rainwater harvesting from the roofs of building is not common, given the lack of resources and skills to invest in this structural development, compounded by a fear of eviction, which would translate into a loss of such investment when displaced.

Some households in the host community are connected to piped water and they are known to support vulnerable households in their neighbourhood. The evolution of water access in Kahda was well recounted by one participant of the qualitative inquiry. "Our water source has changed drastically over the last 10 years. The community who live in Kahda that settled here about 10 years ago, moving here from other parts of Mogadishu town. During the first 6 years in this area, there was a big water crisis. People depended on water trucking, and the water for domestic consumption was being ferried from other parts of Mogadishu to Kahda, and only those who had ready cash were able to get water. This problem continued for six years and it was terrible. But, over the last 4 years, several boreholes were drilled across the whole of Kahda with Abadir alone having three boreholes. The taps in every household are fitted with a meter that shows the amount of water consumed for that month. The households are required to pay for their water consumption every month based on the meter reading. The families that don't have piped connections, commonly the IDPs and refugees, get water from the households with connections and depending on their ability contribute to the monthly water bills. Those who can't contribute are given the water for free. The water supply management is very strict and if a household fails to pay for their water, the water supply is disconnected. The boreholes provide us with adequate water always, but during the times of prolonged drought, the water yields in the boreholes reduce and the water availability during such times is reduced. It doesn't reach the level of water trucking from outside that we use to experience"

Key informant, Abadir, Kahda

According to the qualitative inquiry, water is predominantly collected by women and older children (both boys and girls), although men and neighbours might help in times of a mother's sickness or absence from the household. Time taken to collect water ranges from no time at all (host community with piped connections) to between 15 - 90 minutes for households collecting water from piped connections or boreholes. For residents accessing water from free-of-charge public water points, water collection time can extend beyond 150 minutes, given long queues at the facility.

Analysis of Link NCA quantitative data for SO 19 livelihood zone on water indicators shows that 99.6% (98.5-99.9, 95% CI) of households reported use of an improved water source. However, 85.9% (82.7-88.6 95% CI) of households reported purchasing water, with 84.9% (82.2-87.3, 95% CI) travelling less than 500 metres to the nearest water point. Subsequent analyses taking into account anthropometric measurements of children in the household revealed a significant statistical association between these indicators. This means that children from households which collect water at a distance of 500 metres or less were more likely to be acutely malnourished by WHZ or cGAM (Cf: [Error! Reference source not found.](#)). This means distances to water source less than 500 metres is a risk factor to child acute malnutrition. The findings were counter intuitive and possibly can be attributed to the fact that although the water points are at close proximity to households (more so the free public water points), there are long queues for water and households are limited to only 40 litres of water irrespective of household size (findings from qualitative

discussions). Other issues mentioned was the cost of water, from commercial water points. As much as the commercial water points are near, the cost of water is high, restricting households' access to adequate water. There was, however, no significant statistical association between child acute malnutrition and use of improved water points and households purchasing water. This means children from households utilising improved water sources as well as purchasing water were not more or less likely to be acutely malnourished (Cf: [Error! Reference source not found.](#))

In the SO 05 livelihood zone of Goldogob district, the pastoral dropout (whose livestock died or reduced due to subsequent drought) population who settled in IDP settlements access water free-of-charge from *Barkads*. Most of the *Barkads* do not collect water run off as designed due to poor maintenance, forcing the community to fill through water trucking normally by humanitarian organisations with the occasional "good Samaritan mostly from them diaspora who come to Goldogob to visit family".

In other community units, households rely on a borehole drilled by a community member five years ago. The borehole is said to have improved the community's water access but the water can be fetched for a fee. The cost of water from a borehole fluctuates depending on whether it is serviced by solar energy or a diesel pump. There are frequent breakages of this improved water points, hence communities resort to the available non-improved water points. The *Barkads* are still in use, although they are not able to serve the residents effectively due to population increases. Residents with piped water connections generally allow the purchase of water at a fee and do not help the most vulnerable and economically insecure with free water, as was reported in some areas of SO 19 livelihood zone of Kahda districts.

Analysis of Link NCA quantitative data for SO 05 livelihood zone of Goldogob district indicates the percentage of households utilizing water from improved water point was 56.7% (41.8-70.4 95% CI), with 37.0% (24.5-51.4 95% CI) of households purchasing water. The findings also showed that majority of households 95.5% (88.2-98.4 95% CI) fetch water from a distance less than 500metres. Subsequent analyses taking into account anthropometric measurements of children in the household revealed a significant statistical association between households using improved water points. This means children from households consuming water from improved water points were marginally (p value <0.1) less likely to be acutely malnourished by WHZ and more likely to be acutely malnourished by MUAC (Cf: [Error! Reference source not found.](#)). This counterintuitive finding is attributed to most frequent breakages of improved water points and the high cost of water, which then forces households to obtain water from unimproved water sources. Other water access indicators; households purchasing water and distance to water points of less than 500 metres did not show any statistical association. This means children from households purchasing water as well as collecting water from a distance less than 500 metres were not more or less likely to be acutely malnourished (Cf: [Error! Reference source not found.](#)).

In the SO 15-16 livelihood zone of Baidoa, water sources are varied. Residents of an IDP settlement in Kormari depend on boreholes and open hand dug shallow wells. Boreholes provide water during the dry periods of *Jilaal* (January, February and March) and *Hagaa* (July, August and September). The shallow wells are mainly used during the rainy seasons of *Gu* (April, May and June) and the *Deyr* season (October, November and December). Water availability in this livelihood zone is high during the *Gu* rainy season and typically lowest during the dry seasons, directly reflecting in water prices, which are highest during dry seasons and lowest during a rainy season.

Water at a borehole is reported to be sold at 1500 Somali Shilling for a 20-litre jerry can but it can sometimes be provided free of charge if household are unable to pay. Water can be accessed from

hand-dug wells any time, using a string tied to a container which is then dropped into a well. This method of water collection is likely to result in a contamination of water in a well.

Water access in host communities like Wadajir is provided by a water pipeline, hand dug open shallow wells and water trucking. The households, which can afford to pay for water from a private water company, pay 10-20 USD per month of service, which is only available for three months during a rainy season. During a dry season, a water company ceases the service and people resort to other water sources to meet their household needs.

Villages in agro-pastoral areas further away from Baidoa town, such as Makuda and Bonkai, face water access challenges as they depend on open shallow wells and surface pans, which serve as water reservoirs during the rainy seasons. Water access is therefore hindered during dry seasons with low water yield in nearby shallow wells. Therefore, they are forced to walk to wells about 3 km away, which stretches their water fetching time to 3 -4 hours. Only households with donkey carts are able to fetch adequate amounts to meet their household needs, up to 200 litres per day. The participants of the qualitative inquiry in Bonkai observed that the incidences of diarrhoea had increased in the area since they resorted to consuming water from a water- pan after a borehole broke down.

Analysis of Link NCA quantitative data for SO 15-16 livelihood zone of Baidoa district indicated that the proportion of household utilizing water from improved water point was 93.6% (91.8-95, 95% CI), with 60.4 % (56.9-63.8 95% CI) reported purchasing water. Majority of households 86.6 % (83.6-89.1, 95% CI) of households fetched water from a distance less than 500 metres. Subsequent analyses taking into account anthropometric measurements of children in the household revealed a marginal statistical association (p value <0.1) between these households collecting water from a distance 500 metres. This means children from households fetching water from less than 500 metres were marginally less likely to be acutely malnourished by WHZ This means that utilization of water from a distance less than 500 water is a protective factor to child acute malnutrition. There was, however, no statistical association between child acute malnutrition and households use of improved water point as well as households purchasing water. This meant that children from households using improved water points as well as purchasing water were not more or less likely to be acutely malnourished (Cf: [Error! Reference source not found.](#))

In the SO 13 livelihood zone of Beltweyne district, Shebelle River represents the main water source as most communities live along the river. Villages further away from the river, e.g. Domey and Jawil, rely on a borehole and shallow wells. Some villages downstream seem to rely on water trucking.

"The river water is contaminated up stream and so the water is only good for washing cloth and bathing. Water for drinking and for cooking are trucked by Danish Refugee Council (DRC) in the morning and in the evening,"

Key informant, Domey, Beltweyne

The communities upstream along river Shebelle mentioned that water flow during a dry season reduces and the river becomes salty. The water level in a river depends on rains at Ethiopian highlands, where it originates, and the local rains in Somalia. As a river water level reduces, a steep climb is left behind, which makes water fetching difficult particularly for women and children. In other communities like Bacaad, a water pump was purchased to pump the river water to a water tank on a higher ground, which is then sold at 0.20 USD for a 200-litre jerry can. Other communities resort to water trucking from Beltweyne town at a cost of 60-90 USD for 8,000-10,000 litres.

“Due to cost implication of trucked water, some community households resort to drinking salty water from the river and causes the children to suffer from diarrhoea and other water borne illness”

Key informant, Bacaad, Beltweyne

Water truck service is provided twice a day but is sometimes inconsistent. Community members confirmed that due to large population, some members return home without water after having queued for long periods. With the flooding experienced in Beltweyne, water points were destroyed.

Shallow wells, which are a main water source in communities like Jawil are community owned and managed by a community water committee. Several shallow wells dug along a main ‘*lakh*⁹²’ and interlinked to improve yield. However, during a dry season, the demand increases considerably owing to a large number of pastoral communities moving closer to the settlement. The shallow wells therefore take long to recharge and households queue for water throughout a day.

Water is predominantly collected by women (Cf: [Photo 3](#)) and older children (both boys and girls) although men and neighbours might help in times of mother’s sickness or absence from the household.



Photo 3: Woman carrying water

Analysis of NCA quantitative data for SO 13 livelihood zone of Beletweyne district, on households’ water quality indicates that 42.4% (29.6-56.2, 95% CI) of household’s source water from an improved water point. The findings also showed that 12.5% (6.2 - 23.7 95% CI) of households purchased water. The majority of households 90.3 % (80.0-95.6, 95% CI) obtained water from a distance less than 500 metres. Subsequent analyses taking into account anthropometric measurements of children in the household did not reveal

a significant statistical association between these indicators. This means that children from households which collected water from a distance <500 metres, purchased water and used improved water points were not more or less likely to be acutely malnourished Cf: [Annex 2](#))

Analysis of the various household main water sources across all livelihood zones in the respective districts is shown in (Cf: [Figure 10](#)).

⁹² This is a dry water bed where water collects during rainy season, during dry season households scoop sand to get water underneath-shallow wells

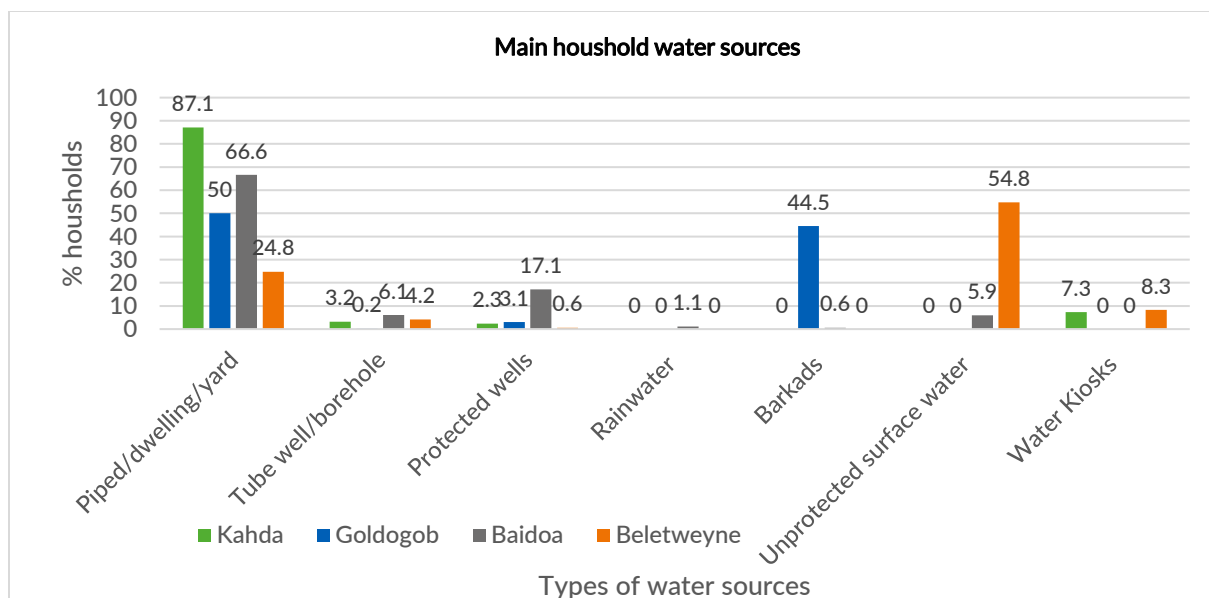


Figure 10: Main household water sources

Household water management

Transport and storage of water at household level are important aspects of water hygiene. Qualitative findings from the SO 19 livelihood zone of Kahda indicated that majority of households collect and stored water using the 20 litre jerry cans. Analysis of Link NCA quantitative data for SO 19 livelihood zone indicated that 81.2% (77.3 - 84.5 95% CI) of households use the same container for transportation as well as water storage. Subsequent analysis for statistical association, showed that children from households who use similar container to transport and store water were less likely to be acutely malnourished by WHZ, meaning use of the same container for water transportation and storage was a protective factor (Cf: [Error! Reference source not found.](#)). This counterintuitive relationship could be attributed to households regularly washing water transportation container due to its frequency of use.

According to the findings from SO 05 livelihood zone of Goldogob, residents reported using metallic drums or jerry-cans for water storage, which makes the water inappropriate for drinking and cooking, if the water is stored there unused for a longer period of time due to effects of metallic container rusting. Analysis of Link NCA quantitative data indicated that 54.4% (42.7-65.7 95% CI) used the same container for transportation as well as water storage. Subsequent analyses taking into account anthropometric measurements of children in the household did not reveal a significant statistical association between these indicators, meaning children from households using same water container for transportation and storage were not more or less likely to be acutely malnourished thus neither a risk factor nor protective factor in this livelihood zone (Cf: [Error! Reference source not found.](#)).

In the SO 15-16 livelihood zone of Baidoa, 64.3% (61.6-67.1 95% CI) of households used the same container for transportation and storage of water. Subsequent analyses taking into account anthropometric measurements of children in the household did not reveal a significant statistical association between these indicators, meaning children from households using same water container for transportation and storage were not more or less likely to be acutely malnourished

thus neither a risk factor nor protective factor in this livelihood zone a (Cf: [Error! Reference source not found.](#)).

Qualitative inquiry revealed households did not have access to water treatment methods, such as aqua tabs, which are only provided by NGOs in time of diarrhoeal outbreaks but the stocks are not replenished on a regular basis.

In the SO 13 livelihood zone of Beletweyne, the Link NCA quantitative data analysis found 32.2 % (20.7- 46.4 95% CI) of households transported and stored water in the same container. Subsequent analyses taking into account anthropometric measurements of children in the household did not reveal a significant statistical association between these indicators, meaning children from households using same water container for transportation and storage were not more or less likely to be acutely malnourished thus neither a risk factor nor protective factor in this livelihood zone (Cf: Annex 2). Qualitative assessment found out that the water is consumed untreated, even if turbid. Households in this livelihood zone were aware of different water treatment methods but the practice was generally limited. The water treatment seemed to be more prevalent in post-flooding periods to prevent diarrhoeal outbreaks.

"The colour of the water determines whether the water should be treated or not. If its thick brownish or dark then you put aqua tab. Otherwise if it's clean and clear, people drink directly,"

Focus group Participants, Bacaad, Beletweyne

Hygiene and sanitation practices

Hand hygiene is a primary measure to reduce infection. Despite being a simple action, it lacks compliance worldwide.⁹³ During the qualitative inquiry at the SO 19 of Kahda district residents said they practiced hand washing before cooking and eating, but not after using a toilet. Inconsistent handwashing and bathing practices were due to inadequate water access and irregular soap purchases as the item was considered expensive however, households reported prioritising daily bathing of children.

Access to latrines was reported and observed as minimal, with an average of 13 households sharing one latrine. The participants of the qualitative inquiry commented that the maintenance of clean facilities was not possible given the high usage. There was evidence of open defecation in all visited locations within the District, especially in and around IDP'S' settlements due to overcrowding. The participants acknowledged that a lack of or inadequate use of latrine is one of contributing factors to sickness, especially among children.

The findings from Link NCA quantitative analysis for SO 19 livelihood zone of Kahda district indicated that 36.8 % (33.7-40.1 95% CI) of households did not have a handwashing station. Subsequent analyses taking into account anthropometric measurements of children in the household revealed a significant statistical association between these indicators, meaning children from households with no handwashing station were less likely to be acutely malnourished by MUAC and cGAM. This finding is counterintuitive and requires further investigation. Other statistical analysis findings indicated a mean household handwashing behaviour (with handwashing stations) on a scale of 0-5 at 1.3(1.3-1.4) which was quite low. Subsequent analyses taking into account anthropometric measurements of children in the household revealed a significant statistical association between these indicators, as increased handwashing behaviour in homes was associated with higher MUAC scores. (Cf: [Annex 2](#)).

⁹³ Source: Who.int/gpsc/5may/tools/who_guidelines-handhygiene-summary.pdf

Household toilet ownership reached 84.9% (81.4-87.8 95% CI), with subsequent analysis showing no statistical significant association meaning children from households which own toilet facility were not more or less likely to be acutely malnourished (Cf: [Error! Reference source not found.](#)). Hygiene observation indicated that 49.0 % (44.8-53.2 95% CI) of households had very poor hygiene with no significant statistical association meaning children from households with very poor hygiene were not more or less likely to be acutely malnourished. Further statistical analysis of household hygiene indicated a mean household hygiene of 3.1(2.9-3.2) out of a possible range of 1-6. Subsequent analyses taking into account anthropometric measurements did not reveal any statistical association. (Cf: [Annex 2](#))

Other findings through observation found out that 34.9 % (31.7-38.3 95%) of children were clean at the time of data collection. Subsequent analysis taking into account anthropometric measurements indicated a significant statistical association meaning clean children were less likely to be acutely malnourished by MUAC (Cf: [Annex 2](#)).

The proportion of households whose children were crawling in the dust or soil was 56.5 % (51.7-61.2 95% CI), while households whose floor were made of soil was 47.6 % (43.6-51.6 95% CI). Subsequent analysis taking into account anthropometric measurements of children in the household indicated a statistical association meaning children from households whose children were crawling in dust or soil and whose floor were made of soil were more likely to be acutely malnourished by MUAC (Cf: [Annex 2](#))

Other hygiene indicators analysed included household utensils left on the floor, with 61.9 % (57.9-65.8 95% CI) of households. Furthermore, 39.5 % (35.5-48.4 95% CI) of household's kitchen wastes were visible, while the proportion of households with animals inside the home were 48.0 % (43.5 - 52.5 95% CI) Subsequent analyses taking into account anthropometric measurements of children in the household did not reveal a significant statistical association between these indicators. This means children from households whose utensils were left on the floor, whose kitchen wastes were visible and animals inside the home were less likely to be acutely malnourished (Cf: [Annex 2](#)).

In the SO 05 livelihood zone of Goldogob district, households within IDP camps and urban areas, there was access to latrine with a reduced number of individuals sharing each latrine unlike SO 19 livelihood zone. The qualitative team observed open defecation was practised more so in the rural pastoral areas despite all visited locations identifying open defecation as a 'risky practice'(Cf: [Table 16](#)).The presence of animals in households raised concern within pastoral households as animals roamed around and inside the house in close contact with children, utensils and areas used for cooking.

The Link NCA Quantitative data analysis for SO 05 livelihood zone, indicated that 59.9 % (45.7 - 72.6 95% CI) of households did not have handwashing station. Subsequent analyses taking into account anthropometric measurements of children in the household did not reveal any significant statistical association between these indicators, meaning children from households with no handwashing station were not more or less likely to be acutely malnourished. The proportion of households who met all the five handwashing behaviours in households with handwashing stations was 0.4 % (0.3 - 4 95% CI). Other statistical analysis findings indicated a mean household handwashing behaviour (with handwashing stations) on a scale of 0-5 was 2.1(2.0 -2.1) which was quite low. Subsequent analyses taking into account anthropometric measurements of children in the household revealed a marginal significant (p value <0.1) statistical association between these indicators, as increased household handwashing behaviour in the households were associated with higher MUAC scores. (Cf: [Annex 2](#))

Household toilet ownership reached 54.7% (42.2-66.4 95% CI) while hygiene observation indicated 27.5 % (16.8 - 41.6 95% CI) of households had very poor hygiene. Further analysis of household hygiene indicator showed a household hygiene mean of 1.8 (1.1 – 2.4) out of a possible range of 1-6 which is low. Subsequent analysis did not reveal a significant relationship with child acute malnutrition. The proportion of households whose children were crawling in the dust or soil was 34.2% (23.5-46.8 95% CI), while households whose floor were made of soil was 25.0% (15.1-38.5 95% CI). Other hygiene indicators analysed included household utensils left on the floor with 31.3 % (20.8 - 44.0 95% CI), while the percentage of households whose kitchen wastes were visible was 23.7 % (14.4 -36.3 95% CI). Other sanitation indicator included animals inside home where 33.7 % (22.4 -47.2 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household did not reveal a significant statistical association between these indicators, meaning household children from households with above mentioned hygiene and sanitation indicators were not more or less likely to be acutely malnourished (Cf: [Annex 2](#))

In the SO 15-16 livelihood zone of Baidoa, hygiene and sanitation practices varied, depending on a location. In an IDP settlement in Kormari, latrine coverage was observed to be very high as a result of NGO support. Each latrine also served as a bathroom, was shared by five households, men and women included. The latrines were close to respective households, easy to use day or night. However, there was no evidence of hand washing facilities during the assessment while some latrines were filling up and/or were already filled up.

Latrine coverage in host communities within Baidoa town was also good, as many households had their own latrines. It was noted, however, that in villages outside Baidoa town latrine coverage was minimal or non-existent, as community members indicated that the majority of households did not have a latrine leading to open defecation, which was rampant. It was also noted that some NGOs conducted community led total sanitation (CLTS) sessions in these locations, resulting in community members digging household pit latrines; however, all collapsed due to unstable black cotton soil after heavy rains. Optimal hygiene practices, including the use of soap, body cleanliness and environmental hygiene were observed in most locations, except for more insecure and inaccessible villages like Makuda, which could not benefit from hygiene sensitisation interventions.

Quantitative analysis of Link NCA data for SO 15-16 livelihood zone of Baidoa district indicated that 22.8 % (21.3 -24.4 95% CI) of households did not have a handwashing station while household toilet ownership was at 79.3% (75.5 -82.6 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household did not reveal a significant association with households without handwashing station as well as toilet ownership. This means children from households without handwashing stations and those with toilet ownership were not more or less likely to be acutely malnourished (Cf: [Annex 2](#))

Hygiene observation indicated that 38.0 % (34.9 – 41.1 95% CI) of households had very poor hygiene. The proportion of households whose children were crawling on the dust were 37.6 % (34.3-41.0 95% CI). The proportion of households whose house floor made of soil was 36.9 % (33.6-40.3 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household revealed a significant statistical association with children from households with floor house made of soil being more likely to be acutely malnourished by MUAC (Cf: [Annex 2](#))

Other hygiene indicators analysed included households whose kitchen utensils were left on the floor at 56.7 % (53.3 – 60.0 95% CI). The proportion of households whose kitchen wastes were visible were 41.5 % (38.1 -45.0 95% CI). The proportion of households, which observed all five

handwashing behaviours and had handwashing station were 3.5% (2.1-5.9 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household revealed a significant association with handwashing behaviours, as children whose caregiver demonstrated all five handwashing behaviours were actually more likely to be malnourished by WHZ and/or cGAM. It is important to keep in mind the cross-sectional nature of data collection- the team observed handwashing during brief household visits, so it's possible that observation was not representative of routine practice. Other statistical findings indicated a mean handwashing behaviour of 2.0(2.0-2.1) with a possible range of 0-5. Subsequent analyses taking into account anthropometric measurements of children in the household revealed a significant association with this indicator, as increased handwashing in households were associated with increased WHZ scores. (Cf: [Annex 2](#))

In the SO 13 livelihood zone of Beltweyne district, the community understood that inadequate hygiene and sanitation practices cause illnesses, such as diarrhoea and skin diseases. Residents acknowledged that hand washing and proper food handling practices can significantly reduce these illnesses. However, in some locations, like Bacaad, scattered human and livestock faeces were evident, suggesting non-optimal sanitation practices and a contamination of living spaces and children's play areas. It was mentioned that open defecation is attributed to frequent flooding, which destroys latrines over time while households in this community have no income to repeatedly repair them.

In villages on higher grounds like Jawil, significant numbers of households displaced from low-lying riverine communities seek refuge after floods. Temporary settlements in and around the village often practice open defecation as latrines are unavailable.

"The river often floods during the Deyr season and sometimes during the Gu season. During such times, households in Bacaad evacuate to higher grounds. When the floodwater recedes, pockets of water collect/pool on shallow areas in the town. Fish and other small aquatic animals are trapped in this pocket of water in and around the village. This stagnant water around homesteads, beneath the fences and on the local roads poses hygiene and sanitation risk to the community and in particular the young children who often play in this stagnant water. The dirty water also acts as breeding sites for mosquito. The trapped aquatic animals die as the water dries up leaving stench smell in the air. It's during such times when diarrhoeal diseases and malaria strikes and most people in the community particularly children fall sick"

Focus group Participant, Bacaad, Beltweyne

The Link NCA quantitative analysis for SO 13 livelihood zone of Beletweyne district indicated that 19.6% (10.9 -32.6 95% CI) of households did not have handwashing station with no household with handwashing station meeting the five handwashing behaviours. Subsequent analyses taking into account anthropometric measurements of children in the household revealed a marginal significant statistical association (p value 0.1) between households with no handwashing stations. This means that children from households with no handwashing stations were marginally less likely to be acutely malnourished by WHZ. These counterintuitive relationships warrant further investigation (Cf: [Annex 2](#)).

The findings also revealed 30.7% (19.7 – 44.5 95% CI) of households owned a toilet. Subsequent analyses taking into account anthropometric measurements of children in the household revealed a significant statistical association between households, which owned a latrine. This means that children from households, which owned latrine, were more likely to be acutely malnourished by MUAC. This could be attributed to the destruction of toilets by floods, which had affected the area thus as much as the household had a toilet, they were not utilizing. (Cf: [Annex 2](#)).

Hygiene observation found out that 21.2 % (13.2 – 32.3 95% CI) of households had very poor hygiene. Subsequent analyses taking into account anthropometric measurements of children in the household revealed a significant statistical association between households with very poor household hygiene. This means that children from households with very poor hygiene were less likely to be acutely malnourished by MUAC. These counterintuitive relationships warrant further investigation (Cf: [Annex 2](#)).

The proportion of households whose children were crawling in the dust or soil was 20.6 % (13.9-29.5 95% CI) with subsequent statistical analysis taking into account anthropometric measurements of children in the household revealing no significant association. The proportion of households whose floors were made of soil was 30.7 % (20.6 -43.0 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household revealed a significant statistical association with households whose floors were made of soil. This means that children from households whose floors were made of soil were marginally less likely to be acutely malnourished by MUAC. Other hygiene related indicators analysed were the mean handwashing behaviour with a scale of 0-5, which found out a mean value of 1.9 (1.8-2.0) with no significant statistical association. The mean household hygiene (increasing uncleanliness) with a range of 1-6 was 1.4 (1.2-1.5) meaning households were fairly clean. Subsequent analyses taking into account anthropometric measurements of children in the household indicated a statistical significant association between these indicators, as increased household cleanliness was associated with higher WHZ scores. This counterintuitive relationship warrants further investigation but could be influenced by low number of malnourished children (Cf: [Annex 2](#)).

Other hygiene indicators analysed included the proportion of household whose utensils left on the floor at 17.6 % (10.7-27.7 95% CI) with subsequent statistical analysis taking into account anthropometric measurements of children in the household revealing no significant association. The percentage of households with visible kitchen wastes was 21.9 % (15.0 -30.9 95% CI). Subsequent analyses taking into account anthropometric measurements of children in the household revealed a marginal significant statistical association (p value <0.1). This means that children from households whose kitchen wastes were visible were marginally less likely to be acutely malnourished by MUAC. These counterintuitive relationships warrant further investigation (Cf: [Annex 2](#)).

During the qualitative inquiry, the team used a risk game to determine participants' attitudes towards a variety of hygiene and sanitation behaviours. The findings indicate a good perception of some behaviours while others do not appear to be aligned with respective optimal practices, indicating a barrier to behaviour change, as shown in (Cf: [Table 16](#)).

Table 16: Perception of risks related to Water, Sanitation and Hygiene practices.

Behaviour	Perception of risk			
	SO 19 Kahda	SO 05 Goldogob	SO 15-16 Baidoa	SO 13 Beltweyne
Water				
Drinking water at the source	Risky	Not risky	Not risky	Not Risky
Drinking water from the water stream	Risky	Risky	Risky	Risky
Drinking rainwater	Not Risky	Not Risky	Not risky	Not Risky
Leaving water containers open	Risky	Risky	Risky	Risky
Hygiene				
Letting flies sit on a plate of food	Risky	Risky	Risky	Risky
Eating without washing hands	Risky	Risky	Risky	Risky
Cooking without washing hands	Risky	Risky	Not risky	Risky

Not washing hands after defecating	Risky	Risky	Risky	Risky
Sanitation				
Defecating around the house	Risky	Risky	Risky	Risky
Cleaning a latrine	Not Risky	Not Risky	Not risky	Not Risky
Baby playing in the dirt	Not Risky	Risky	Risky	Risky
Baby in contact with household animals	Risky	Risky	Risky	Risky
Animals wandering around the house	Not Risky	Not Risky	Not risky	Not Risky

5.5. Gender

Marriage and decision-making

Qualitative discussions amongst female focus group participants from SO 19 livelihood zone reported that average age at which girls are married at 17 years. Early marriage has reportedly been happening for generations, and as such, is generally accepted by the wider community.

The lack of educational system and other opportunities to engage youth ages 15 – 20 years is believed to incentivize early marriage, as adolescents are perceived as young adults. Early marriage is “*the best way of protecting the young people from indulging in premarital sexual activities*”, a view held by both parents and older community members. The cultural value placed on birthing and children is also attributed as a reason for early marriage, as men “*prefer to go for a young girl who will continue to give birth too many children.*” Some female participants felt that early marriage is problematic for girls, as they are not physically and mentally prepared for the household responsibilities that marriage and (often) subsequent parenthood carry. Storytelling highlighted that early marriage amongst girls is often dictated by the prevailing situation and the stress of the family. Large household size, lack of income and access to food are identified as factors that encourage/lead to early marriage. Early marriages typically increase during drought seasons, as households struggle to access food. Despite believing the ideal age for marriage is 20 years, women reported feeling obliged to marry young, as they are bound by culture and want to ease the pressure on already struggling households. As such, women expressed being ‘ready to change’ early marriage, early pregnancy and low child spacing, but face a constraint in decision making and other stressors in their households.

Once married, women are thought of as external sources of support to the family in times of livelihood challenges. A story provided during the FGDs highlights the level of help provided from a married daughter to the family, which would not be available had the young woman remained unmarried in the family home.

In terms of decision-making, findings from IDP livelihood of Kahda FGD participants commented that women can make decisions regarding which food to buy and cook only, whilst others were of the opinion that all decisions were to be made jointly. Decision making concerning the purchase of goods from the market was primarily at the females’ discretion, although many said their decisions were prohibited by the amount of cash allocated to them for spending. Men echoed these differences in decision making, commenting that there are both big and small decisions, and the response to decision making varies.

“There are big decisions and small ones. The small ones include those activities done at home like what the family eats and wears and household expenses. But the majority of the big decisions are discussed and made jointly by both men and women. These include marriages, moving the family, or hosting a relative”.

Focus group Participant, Omar Fiasco, Kahda

It was found out in Kahda that change in decision making was also highlighted, shifting from the, previous pastoral setting where men used to go to town once in a while and do the shopping and

women just cooked, to a situation where women and men go out looking for income as well as household expenditure.

High divorce levels were mentioned throughout various FGDs and KIIs as an issue the community faced in Kahda. When asked to recount areas of dissatisfaction with decision making in the household, women participants identified that communication and compromise were essential elements to resolving conflict. One member recounted a story of how, lack of communication and compromise, coupled with traditional stereotyping of decision-making roles lead to divorce within a household.

“There was an instance when both the man and women went out to look for work. The man did not find work and he wanted to use the little money that the woman had earned from her manual work to buy Khat⁹⁴. The woman refused to give him the money and chose to feed the family instead. She was divorced for \$5. That is why there is a high divorce rate in this village”.

Focus group Participants, Ligligado, Kahda

Quantitative analysis of FSNAU data indicate that 26.8 % (25.8-27.9 95% CI) of households' key decision-making was done by females or both male and female, while 32.3% (31.2-33.4 95% CI) of household main provider were female or both male and female. This indicates the level of household decision-making and provision was more male dominated. Subsequent analyses taking into account anthropometric measurements of children in the household did not reveal a significant statistical association between these indicators, meaning household decision making and provision were not significantly associated with acute malnutrition, and therefore children from households where decision making and main provider were female or both male and female were not more or less likely to be acutely malnourished by WHZ (Cf: Annex 3).

Early marriages in the SO 05 livelihood zone of Goldogob district were said to be driven by peer pressure and social media, where mothers complained that the girls got married before they were adequately trained to take care of children, similar to the view expressed in Kahda.

“Nowadays it is common to see a child having a child yet they are busy with their touchscreen ('beer salaah') mobiles, rather than taking care of the child,”

Focus group Participants, Qansahle, Goldogob

It was mentioned that adolescent who give birth depend on their mother for childcare. Low child spacing, referred to as 'isku nuug,' and mothers falling pregnant 'too quickly' was mentioned by community members during qualitative enquiry to be the cause malnutrition among mothers.

Decision making in SO 05 livelihood zone of Goldogob district, female residents expressed their feelings that “whether correct or incorrect, the husband is the leader of the family and any decision that he has made is believed to be the correct decision in the interest of the entire family.” In this regard, there is little contention by women with regards to the men's decision-making choices.

A change in decision-making was highlighted from Goldogob district in relation to arranged marriages, as a result of female empowerment for women;

“In the past girls were going by arranged marriages by the parents. Now the girls and their mothers make the decision on whom they will marry. It is actually the girls to decide, so things are changing when it comes to women's decisions”.

Key informant, Xero Jale, Goldogob

⁹⁴ A traditional herb chewed as a stimulant.

Quantitative analysis of FSNAU data indicated that 12.0 % (10.5 – 13.7 ,95% CI) of households key decision making was done by women or both male and female while 10.5 % (9.1 -12.1 95% CI) of households main provider were female or both male and female. This indicate the level of household decision-making and provision was more male dominated. Subsequent analyses taking into account anthropometric measurements of children in the household did not reveal a significant statistical association between these indicators, meaning that household decision making and provision by females was not significantly associated with acute malnutrition, thus children from households where decision making and main provider were female or both male and female were not more or less likely to be acutely malnourished by WHZ (Cf: Annex 3).

In the SO 15-16 livelihood zone of Baidoa, the practice of early marriage was common, especially in IDP camps, where adolescent females are married very early (16-18) years. Women are responsible for purchase of household food and non-food commodities. In the markets, all observed milk traders were women, as were the producers who brought the milk to the market. Women control of the income earned from milk sales and used it to fulfil household food consumption requirements.

Quantitative analysis of FSNAU data for SO 15-16 indicated that 11.0 % (9.4 -12.8 95% CI) of households' key decision-making was done by females or both male and female, while 6.6% (5.4 - 8.1 95% CI) of households' main provider was female or both male and female. This reveals low level of women household decision making and provision. Subsequent analyses taking into account anthropometric measurements of children in the household did not reveal a significant statistical association between these indicators, meaning household decision making and provision by females was not significantly associated with acute malnutrition, thus children from households where decision making and main provider were female or both male and female were not more or less likely to be acutely malnourished by WHZ (Cf: [Error! Reference source not found.](#)).

In the SO 13 livelihoods zone of Beltweyne districts, early marriages are reportedly common. Early marriages were blamed on peer pressure, lack of income, lack of education and ease of communications due to access and availability of mobile phones.

“Young man of around 18-20 years with no income standing at the corner of the street and whistling to every lady that passes by. They often have mobile phones and start lying to our girls”.

Focus group Participant, Bacaad -Buke, Beletweyne

Decision-making is the duty of men, according to FGD participants. The smaller decisions which include what/ when to cook, portion sizes, buying goods from the market, lending to neighbours and getting small credit from the local shop were decisions made by women. Decisions like migration, marrying off a son or daughter, healthcare and education was done jointly between the male and female partner. It was also found out that women who headed of their household typically consulted extended family and friends.

Quantitative analysis of FSNAU data for SO 13 livelihood zone of Beltweyne district indicate that 26.9 % (24.1- 30.0 95% CI) of householdkey decision were female or both male and female while 22.3 % (19.7- 25.1 95% CI) of household main providers were female. Subsequent analyses taking into account anthropometric measurements of children in the household revealed a significant statistical association with household provision, meaning that children from households whose main provider were female or both male and female were less likely to be acutely malnourished by WHZ (Cf: Annex 3). This could be attributed to the qualitative findings showing women had higher chances of getting casual labour than men therefore able to obtain income and descion power to purchase household items.

Gender roles, education and livelihood opportunities

Education level for both men and women in the four livelihood zone under study was found to be low with majority accessing qur’anic schools .Factors leading to low education levels are shown in Table 17.

Table 17: Education Barriers

Livelihood zone/district	SO 19 Livelihood zone (Kahda district)	SO 05 Livelihood zone (Goldogob district)	SO 15-16 Livelihood zone (Baidoa district)	SO 13 Livelihood zone (Beltweyne district)
Barriers to access to Education	Low importance to education	Low importance to education	No or few school infrastructure ⁹⁵	Low importance to education
	Child labour- children working to provide household labour ⁹⁶	No or few school infrastructure	Lack of job opportunities for those who have completed schools	Child labour- children working to provide household labour
		Lack of teachers In schools		Lack of job opportunities for those who have completed schools

The most common barrier to education was its perceived importance and lack of job opportunities for those who have completed school. Child labour was mentioned as one of the hindrance to children access to education more so the girl child who support their mothers with household responsibilities as their mothers look for productive work. The least commonly mentioned barrier was lack of teachers in schools for the pastoral livelihood.

Differences in productive activities and gender roles were discussed in the KIIs and FGDs in the four livelihood zone under study and findings summarized in Table 18. There is noted shift of gender roles within the SO 19 livelihood zone of Kahda compared to their past/previous pastoral/agro pastoral background, where men traditionally were seen as household providers and women as child caregivers. This change could be attributed to urban influence as well as the need for households to meet daily needs; thus, both men and women had to be involved in livelihood activities. Qualitative inquiry revealed a situation where both men and women are searching for incomes to meet household’s needs.

“These days if the women work you might see the father stay at home looking after the children. This would have been unheard of in our pastoral setting. Behaviours are slightly changing even though they are slow. The level of education has improved and gender roles are not as distinct as they used to be”

Key informant, Shimbiralle, Kahda

In the SO 05 livelihood zone of Goldogob, more fixed gender roles were observed, especially in Darussalam, a border village with Ethiopia. In this location, men who used to help them with activities at the household in terms of grazing the animals and collecting water never support their women due to *Chat* (Miraa⁹⁷ .This is the effect of drug abuse due to desperation as a result of lack of livelihood for most households as a result of drought led to loss of livelihood.

The summary in Table 18 also shows some progressive gender roles in SO 13 livelihood of Beltweyne and SO 15-16 livelihood zone of Baidoa. There are more shared roles between men and women, in activities such as working in the markets, using donkey cart to carry goods, and

⁹⁵ School infrastructure limited in rural areas

⁹⁶ Majorly in IDP camps were girls support their mothers with household chores and income generating activities

working at firms most of which they are revolving around their livelihood, which is agriculture and sale of agricultural products.

Table 18: Gender Roles men and women

District	Women Only	Women and Men	Men Only
SO-15-16 Livelihood zone of Baidoa district	<ul style="list-style-type: none"> ▪ Breast feeding ▪ Washing and feeding of children ▪ Domestic work ▪ Small scale business activities ▪ Delivery of women in labour ▪ Working in other households doing menial work such as washing, cleaning 	<ul style="list-style-type: none"> ▪ Working in markets ▪ Collecting firewood ▪ Using donkey carts to carry items for households and business premises and farms 	<ul style="list-style-type: none"> ▪ Working in farms, quarries, road construction sites
SO-13 Livelihood zone of Beltweyne district	<ul style="list-style-type: none"> ▪ Household domestic activities which includes preparing and serving meal, ensure the standard of hygiene at household, bathing and grooming children, Breast feeding and care for younger children ▪ Washing and feeding of children ▪ Working in other households doing menial work such as washing, cleaning particularly women in IDPs camps. ▪ Construction/plastering of thatched traditional houses using cow dung. ▪ Sweeping the houses and the compound 	<ul style="list-style-type: none"> ▪ Fetching water and firewood, ▪ Running Small scale business activities ▪ Working at farms ▪ Look after livestock ▪ Go to the market and purchases household needs 	<ul style="list-style-type: none"> ▪ Quarries, road construction sites ▪ Loading and offloading trucks ▪ Supply of construction materials such as logs, rocks ▪ Construction of walled houses
SO-05 Livelihood zone of Goldogob district	<ul style="list-style-type: none"> ▪ Breastfeeding ▪ Washing and dressing the children. ▪ Fetching firewood 	<ul style="list-style-type: none"> ▪ Child discipline ▪ Fetching of water for the household 	<ul style="list-style-type: none"> ▪ Milking of livestock ▪ Transporting and selling of milk to market ▪ Casual manual labour ▪ Provision of income ▪ Daily attendance at Mosque ▪ Shopping for food and non-food items
SO-19 Livelihood zone of Kahda district	<ul style="list-style-type: none"> ▪ Breastfeeding ▪ Washing and dressing the children ▪ Fetching of water for the household 	<ul style="list-style-type: none"> ▪ Casual manual labour ▪ Provision of income ▪ Shopping for food and non-food items 	<ul style="list-style-type: none"> ▪ Daily attendance at Mosque ▪ Child discipline

Women's workload, perceived external support and female-headed households

In SO 19 livelihood zone of Kahda, women are in charge of family activities, productive, and economic activities. After waking up at 4 am to pray and prepare breakfast for the family, traditional economic activities begin. Depending on the workplace's proximity to home, women return to the homestead around 4 pm, where domestic work including cooking, washing utensils, homestead cleaning and fetching water begins. These activities continue until bedtime, around 10 pm. The typical workload is reportedly *"hard and tiresome with often no break"*. Exhaustion puts pressure on the women as the primary caregivers to children.

"I feel most busy and tired when I return home from work, but, I drag myself since I still have a family to look after. No help is available; everyone has his or her issue. When I feel most tired we usually bath, apply oil and sleep, we

leave the kids in the morning and no one is there to take care of the children as they need looking after. It's like my children are orphans and don't have a mother or father as I play both roles forced by circumstances, but to be honest it is not good."

Focus group Participant, Omar Fiasco, Kahda

Quantitative analysis of NCA data for SO 19 Livelihood zone of Kahda district indicates that 27.5% (24.1-31.2,95% CI) of women felt highest external support. Subsequent statistical analysis taking into account anthropometric measurement indicated a statistical significance with children from households whose mothers felt highest external support being less likely to be acutely malnourished by MUAC. Other analysis indicated a mean women external support of 2.4(2.3-2.5) out of a range of 1 -4 , with no statistical significant association (Cf:Annex 2).

In the SO 05 livelihood zone of Goldogob, displacement often prompts a shift in livelihood activities and thus, a shift in workload. Residents of Alaale (Pastoral dropouts) commented that childcare practices changed when leaving a pastoral setting to move to the urban IDP camps. In the pastoral setting, camels and donkeys helped carry jerry cans of water from the water point, and firewood was readily available closer to the home, now that they lost livestock due to drought these responsibilities are now done by women limiting childcare practices.

In addition to the lack of animals to ease physical burden of workload, assistance from other household members has reportedly reduced. Women in Darussalam, a border village with Ethiopia, commented that men used to help them with household activities such as taking the animals to pasture and collecting water, which enabled them to prioritise childcare and cooking activities. However, over time, this assistance has been affected by the increasing trend of *Khat (miraa)*⁹⁷.

"There are a few men who support us to graze and water the animals. The majority have abandoned their duties and are being held hostage by chad (miraa). The majority chew all night and sleep all day. We are waiting on Allah (God) to change our circumstance."

Focus group Participant, Darussalam, Goldogob

Increased habitual chewing *Miraa (Chat)* is reportedly triggered by a lack of productive activities, and women highlighted the practice as increasing their workloads and reduction in household income. The women expressed their views that they desire the men to stop this activity and refocus funds and time on the household responsibilities.

In Goldogob community/village, female participants identified the burden of daily activities as major deterrents to adequate feeding, especially exclusive breastfeeding, and care of children. Pregnant women were identified as particularly vulnerable to an overwhelmingly high workload. The high number of female-headed households in this District is attributed to migration of male counterparts with livestock, as well as search for opportunities elsewhere.

Quantitative analysis of NCA data for SO 05 Livelihood zone of Goldogob district indicates that 63.2% (50.8-74.2 95% CI) of women felt highest external support. Subsequent statistical analysis taking into account anthropometric measurement indicated no statistical significance with children from households whose mothers felt highest external support being neither less nor more

⁹⁷ Miraa is a local name for Khat. Khat is a plant where the leaf and stem are used as a recreational drug and as medicine. As a recreational drug, the leaves and stem are chewed by people in East Africa and the Arabian countries to elevate mood. The World Health Organization lists khat as a drug that creates "dependence" in people, meaning it produces a continuing desire to keep using it. In Somalia, civilian and military use of khat has been blamed for fuelling civil war, draining the nation's economy, and undermining international relief efforts. Source: <https://www.rxlist.com/khat/supplements.htm>

likely to be acutely malnourished. Other analysis indicated a mean women external support of 1.6(1.5-1.6) out of a range of 1-4, with no statistical significant association with child acute malnutrition (Cf: Annex 2).

In the SO 15-16 livelihood zone of Baidoa district, shows that women bear the burden of searching for food and income earning opportunities. This burden was noticeably worse for female IDP's, who engage in labour intensive agricultural activities. After leaving the farms, women search for food, arriving home late in time to attend to other household chores, such as cooking, feeding and dressing the children, fetching firewood, and collecting water.

Quantitative analysis of NCA data for SO 15-16 Livelihood zone of Baidoa district indicates that 17.6% (15.5-19.9 95% CI) of women felt highest external support. Subsequent statistical analysis taking into account anthropometric measurement indicated no statistical significance with children from households whose mothers felt highest external support being neither less nor more likely to be acutely malnourished. Other analysis indicated a mean women external support of 2.6(2.6-2.7) out of a range of 1-4, with no statistical significant association with child acute malnutrition (Cf:Annex 2).

In the SO 13 livelihood zone of Beltweyne, women on average are engaged in household and other work for about 16 hours a day, with activities ranging from cooking, bathing, feeding of children, fetching water and firewood, cleaning the homestead, milking livestock often, and taking them out for grazing. Women were also responsible for purchasing food and non-food commodities. Women with children older than 13 years or a relative 'helper' have reduced workload. Children can support their mothers with cooking, fetching water and firewood, cleaning the homestead and taking care of the younger children when the mother is away.

In Beltweyne, traditionally men were credited for doing labour intensive work on the farm and in the market to provide for the family, while the women stayed home and looked after the family and children. Due to poverty and many recurring shocks, women now engage in work perceived as labour intensive, which were traditionally reserved for men. Now, both men and women participate in agricultural labour, with both men and women waking up early in the morning around 6am and sometimes return home around 7pm engaging themselves in productive responsibilities. Heavy maternal workload delays health seeking and mothers mentioned that they seek healthcare when the situation had worsened.

Quantitative analysis of NCA data for SO 13 Livelihood zone of Beletweyne district indicates that 8.6 % (5.2 -14.1,95% CI) of women felt highest external support. Subsequent statistical analysis taking into account anthropometric measurement indicated no statistical significance with children from households whose mothers felt highest external support being neither less nor more likely to be acutely malnourished. Other analysis indicated a mean women external support of 2.1(2.0 -2.1) out of a range of 1-4, with a significant statistical association indicating an increase in perceived maternal external support leads to a decrease in MUAC scores (Cf:Annex 2).

Men's workload

In the IDP's' livelihood of Kahda, manual labour was reported as the main productive activity for mainly the IDPs. It was noted that the host community working in NGOs, government offices and private business.

Discussion with host community a community which has higher economic and political as well as social standing in Kahda mentioned that IDPs' from pastoral backgrounds are 'proud' and unlikely to beg or engage in manual labour. They mentioned that changes in lifestyle and routine from their

traditional livelihood of livestock keeping to the current search for uncertain casual labour in urban area negatively impact their traditional social structure, identity and security.

Men's workload is described as 'intense'. The need for rest is highlighted; at the same time, the lack of regulations regarding working hours are mentioned. Weekend rest and leave are only common amongst the men that work for organisations and government, whilst other individuals, "must go out to do manual labour so they can feed their families".

The majority of men in the pastoral livelihood zone of Goldogob district seek income generating activities in neighbouring villages within walking distance, which limits the number of opportunities available. In villages like Qansahle, which is served by a broader transportation network, men migrate daily to larger towns such as Goldogob, Bursalah and Galkacyo, in search of casual manual labour. Livelihoods and corresponding workloads have changed over time, as a result of conflict and drought. Many men perceived this struggle to identify work as a relatively new and unwelcomed shift.

"There are no specific jobs for the pastoral drop out men due to scarcity of casual jobs in the village and no livestock to take care of. Youth and young men are idle and opt to chew miraa at night and sleep during the day. Qansahle transit route the youth get miraa from the heavy truck drivers and other road users for free or below market price."

Key informant, Qansahle, Goldogob

In the agro pastoral livelihood of Baidoa district, agricultural labour was reported to be an important productive activity predominantly for men, though women participate in a smaller extent. Agricultural labour activity is highest during the two rainy seasons, when labour is needed in rural areas for planting and harvesting.

In the riverine livelihood zone of Beltweyne, traditionally men were credited for doing labour intensive work in the farms and labouring in the market to provide for the family where they are engaged in agricultural labour waking up early in the morning around 6am and sometimes return home around 7pm.

5.6. Malnutrition

Anthropometric data collection results

Anthropometric data was collected in from SO 19 livelihood zone of Kahda District, SO 05 livelihood zone of Goldogob, SO 15-16 livelihood zone of Baidoa district and SO 13 livelihood zone of Beletweyne District. Malnutrition prevalence among children 6-59months was varied with very high acute malnutrition status in SO 19 livelihood zone and SO 05 livelihood zone Kahda and Goldogob districts respectively (GAM above 15 % WHO threshold⁴ categorised as critical as per the IPC thresholds⁵). Malnutrition prevalence in the SO 15-16 and SO 13 livelihood zones of Baidoa and Beletweyne districts respectively were classified as high according to WHO thresholds of 10 and <15, also classified as serious by IPC thresholds as shown in Table 19 .Other anthropometric prevalence's are highlighted subsequent sections below.

Table 19: Acute malnutrition results and interpretation by livelihood

District	GAM WHZ and or Oedema	GAM by MUAC	Combined GAM_WHZ/Oedema/MUAC	Interpretation WHO ⁹⁸ /IPC ⁹⁹
SO 19 LZ of Kahda District	11.8 %	8.3 % (6.0 - 11.4 95% CI.)	16.0 % (12.9 - 19.6 95% CI.)	Very High(WHO) ⁹⁸

⁹⁸ Who.int/nutrition/publication/severe malnutrition

⁹⁹ Ipcinfo.org/ipcinfo-website/ipc-overview-and-classification-systems/ipc-acute-malnutrition-classification/en/

	(9.4 - 14.7 95% CI.)			Critical (IPC) ⁹⁹
SO 05 LZ Goldogob District	16.2 % (13.0 - 20.0 95% CI.)	3.5 % (2.0 - 5.9 95% CI.)	17.4 % (14.3 - 21.1 95% CI.)	Very High(WHO) ⁹⁸ Serious (IPC) ⁹⁹
SO 15-16 LZ of Baidoa district	8.5 % (6.2 - 11.5 95% CI.)	4.1 % (2.8 - 5.9 95% CI.)	10.7 % (8.5 - 13.4 95% CI.)	High(WHO) ⁹⁸ Serious I (IPC) ⁹⁹
SO 13 LZ of Beltweyne district	9.2 % (7.0 - 12.0 95% CI.)	5.4 % (3.8 - 7.8 95% CI.)	(95) 13.6 % (11.3 - 16.2 95% CI.)	High(WHO) ⁹⁸ Serious (IPC) ⁹⁹

A further analysis of malnutrition by sex indicates that boys were more malnourished than girls across all districts with majority of the malnourished children being moderately malnourished as indicated in [Table 20](#).

Table 20: Prevalence of moderate and severe acute malnutrition WHZ (and/or oedema) and by sex (all study locations)

Indicators	Livelihood zone /District	All	Boys	Girls
Prevalence of global malnutrition (<-2 z-score and/or oedema)	SO 19 LZ Kahda district	(96) 11.8 % (9.4 - 14.7 95% CI)	(55) 13.1 % (10.2 - 16.6 95% CI)	(41) 10.4 % (7.6 - 14.0 95% CI)
	SO 05 LZ Goldogob district	(92) 16.2 % (13.0 - 20.0 95% CI)	(54) 19.1 % (14.8 - 24.4 95% CI)	(38) 13.2 % (9.6 - 18.0 95% CI)
	SO 15-16 LZ Baidoa district	(55) 8.5 % (6.2 - 11.5 95% CI)	(31) 9.7 % (6.2 - 14.8 95% CI)	(24) 7.3 % (4.8 - 10.9 95% CI)
	SO 13 LZ Beltweyne district	(63) 9.2 % (7.0 - 12.0 95% CI)	(35) 10.5 % (7.3 - 15.0 95% CI)	(28) 8.0 % (5.6 - 11.4 95% CI)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	SO 19 LZ Kahda district	(80) 9.8 % (7.7 - 12.5 95% CI)	(49) 11.7 % (8.9 - 15.1 95% CI)	(31) 7.8 % (5.5 - 11.1 95% CI)
	SO 05 LZ Goldogob district	(82) 14.4 % (11.4 - 18.0 95% CI)	(48) 17.0 % (13.1 - 21.8 95% CI)	(34) 11.8 % (8.4 - 16.4 95% CI)
	SO-15-16 LZ Baidoa district	(48) 7.4 % (5.4 - 10.2 95% CI)	(26) 8.1 % (5.2 - 12.6 95% CI)	(22) 6.7 % (4.3 - 10.2 95% CI)
	SO 13 LZ Beltweyne district	(48) 7.0 % (5.5 - 9.0 95% CI)	(27) 8.1 % (5.6 - 11.5 95% CI)	(21) 6.0 % (4.1 - 8.7 95% CI)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	SO 19 LZ Kahda district	(16) 2.0 % (1.2 - 3.2 95% CI)	(6) 1.4 % (0.6 - 3.1 95% CI)	(10) 2.5 % (1.4 - 4.7 95% CI)
	SO 05 LZ Goldogob district	(10) 1.8 % (0.9 - 3.3 95% CI)	(6) 2.1 % (0.9 - 4.8 95% CI)	(4) 1.4 % (0.5 - 3.5 95% CI)
	SO 15-16 LZ Baidoa district	(7) 1.1 % (0.4 - 2.7 95% CI)	(5) 1.6 % (0.5 - 4.4 95% CI)	(2) 0.6 % (0.1 - 2.5 95% CI)
	SO 13 LZ Beltweyne district	(15) 2.2 % (1.1 - 4.2 95% CI)	(8) 2.4 % (1.1 - 5.3 95% CI)	(7) 2.0 % (0.9 - 4.3 95% CI)

Analysis of Link NCA child anthropometric data using ENA for SMART version January 11th 2020, shows in the SO 19 livelihood zone of Kahda, children aged 6-17 months were more malnourished, as well as 42 to 59 months by WHZ . In the SO 05 livelihood zone of Goldogob children aged 6-29 months and 42 to 59 months were more malnourished by WHZ as shown in (Cf: [Table 21](#)).

In the SO 15-16 livelihood zone of Baidoa, children aged 6-41 months were more malnourished while in the SO 13 livelihood zone of Beletweyne children aged 6-17 and 54-59 months were more malnourished as shown in [Table 21](#).

Statistical analysis of Link NCA data indicated that in SO 19 livelihood zone of Kahda, 65.2% (62.5-67.9 95% CI) of children were aged less than 36 months and were more likely to be malnourished by MUAC and combined GAM. Further analysis of mean age of children indicated a mean of 30.1(29.1- 31.2) with subsequent analyses taking into account anthropometric measurements of children in the household showing a significant statistical association meaning an increase in child's age in months was associated with higher MUAC scores (Cf: [Annex 2](#)).The proportion of male children were 51.2% (47.7-54.5 95% CI) with subsequent statistical analysis for association taking into account anthropometric measurements of children indicated no significant statistical association between sex (boys) and acute malnutrition meaning male child were not more or less likely to be acutely malnourished (Cf: [Annex 2](#)). Analysis of FSNAU data for the same SO 19 livelihood zone of Kahda indicated that the proportion of female children were 49.2% (48.1 -50.3 95% CI). Subsequent statistical analysis for association taking into account anthropometric measurements of children indicated a significant statistical association between sex (female) and acute malnutrition meaning female children were more likely to be acutely malnourished by WHZ (Cf: [Annex 3](#)).

In the SO 05 livelihood zone of Goldogob district, 49.7% (46.5-53.0, 95% CI) were male children with subsequent analysis taking into account anthropometric measurements of children indicating male children were more likely to be acutely malnourished by WHZ and cGAM. The children age which was most vulnerable to acute malnutrition was age less than 36 months which accounted for 60.6%(56.4-64.7, 95% CI). Further analysis of mean age of children indicated a mean of 30.4(29.3- 31.6) with subsequent analyses taking into account anthropometric measurements of children in the household showing a significant statistical association. This shows that increased child age in months was associated with higher MUAC scores (Cf:[Annex 2](#)). Analysis of FSNAU data for the same SO 05 livelihood zone of Goldogob indicated that the proportion of female children were 48.4% (46.6 -50.2 95% CI). Subsequent statistical analysis for association taking into account anthropometric measurements of children indicated a significant statistical association between sex (female) and acute malnutrition meaning female children were more likely to be acutely malnourished by WHZ (Cf: [Annex 3](#)).

In SO 15-16 livelihood zone of Baidoa, children aged less than 36 months accounted for 61.6% (57.3-65.7, 95% CI) with subsequent statistical analysis revealing children aged less than 36 months were more likely to be malnourished by WHZ (Marginally-p value <0.1), MUAC and cGAM. Further analysis of mean age of children indicated a mean of 31.3 (30.2- 32.4) with subsequent analyses taking into account anthropometric measurements of children in the household showing a significant statistical association. This shows that increased child age in months was associated with higher MUAC scores. The proportion of male children was 50.4% (46.8-54.0, 95% CI) with subsequent analysis taking into account child anthropometric measurement indicated no significant association between male child and acute malnutrition meaning male children were not more or less likely to be acutely malnourished Cf: [Annex 2](#)). Analysis of FSNAU data for the same SO 15-16 livelihood zone of Baidoa indicated that the proportion of female children were 49.3% (48.1 -50.4 95% CI). Subsequent statistical analysis for association taking into account anthropometric measurements of children indicated a significant statistical association between sex (female) and acute malnutrition meaning female children were more likely to be acutely malnourished by WHZ (Cf: [Annex 3](#)).

In the SO 13 livelihood zone of Beletweyne, the proportion of children aged less than 36 months was 61.3%(56.6-65.7 95% CI) with subsequent analysis indicating that children aged less than 36 months were more likely to be acutely malnourished by MUAC but less likely to be acutely malnourished by WHZ. Further analysis of mean age of children indicated a children mean of 31.9 (30.9 -33.0) with subsequent analyses taking into account anthropometric measurements of children in the household showing a significant statistical association. This shows that increased child age in months was associated with lower WHZ scores and higher MUAC scores. The findings are counter intuitive and requires futhers investigation. The proportion of male children in this livelihood zone 48.2% (44.6-51.8 95% CI) with subsequent analysis taking into account anthropometric measurements of children indicating no signicant statistical association with child acute malnutrition meaning male children were not more or less likely to be acutely malnourished(Cf: [Error! Reference source not found.](#)). Analysis of FSNAU data for the same SO 13 livelihood zone of Beletweyne indicated that the proportion of female children were 48.2% (46.4 - 50.1 95% CI). Subsequent statistical analysis for association taking into account anthropometric measurements of children indicated no significant statistical association between sex (female) and acute malnutrition meaning female children were not more or less likely to be acutely malnourished (Cf: [Annex 3](#)).

Table 21: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or edema for all livelihood zones under study.

	SO 19 Kahda district				SO 05 Goldgob district				SO 15-16 Baidoa district				SO 13 Beltweyne district			
	Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)	
Age (months)	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
6-17	9	4.2	27	12.6	4	3.1	16	12.4	4	3.1	10	7.8	6	4.3	9	6.4
18-29	0	0.0	19	9.0	1	0.7	21	13.9	1	0.6	12	6.8	2	1.1	6	3.3
30-41	1	0.6	11	6.5	1	0.6	14	8.9	0	0.0	16	9.8	4	2.4	13	7.9
42-53	4	2.7	15	10.3	3	3.1	18	18.4	1	0.8	9	7.4	0	0.0	9	7.1
54-59	0	0.0	8	10.8	1	3.0	13	39.4	1	1.7	1	1.7	3	4.5	11	16.4
Total	14	1.7	80	9.8	10	1.8	82	14.4	7	1.1	48	7.4	15	2.2	48	7.0

Maternal Malnutrition

According to the NCA data, the proportion of mothers in SO 19 livelihood zone of Kahda district with MUAC of less than 220 mm were 2.6% (1.3- 5.2, 95% CI). Subsequent analysis taking into account child anthropometric measurement indicated a signficant statistical association with this indcators; meaning children from hoshholds with mothers having a MUAC value less than 220 mm were more likely to be acutely malnourished by MUAC and cGAM.The mean maternal MUAC score was 290.4 (287.3 -293.5), Subsequent analyses taking into account anthropometric measurements of children in the household indicated a statistical significant association between these indicators, as increased mothers MUAC were associated with increased child WHZ and MUAC scores Cf: [Annex 2](#))

Analysis of NCA data for SO 05 livelihood zone of Goldogob district indicated the proportion of mothers with MUAC of less than 220 mm were 5.4% (3.3 – 8.7, 95% CI). Subsequent analysis taking into account child anthropometric measurement indicated a marginal statistical significance (P-value < 0.1) with this indicators; meaning children from households with mothers having a MUAC value less than 220 mm were marginally more likely to be acutely malnourished by MUAC and cGAM. The mean maternal MUAC score was 289.4 (284.8 -293.5), Subsequent analyses taking into account anthropometric measurements of children in the household indicated no significant statistical association between these indicators, Cf: [Annex 2](#)

Analysis of NCA data for SO 15-16 livelihood zone of Baidoa district indicated the proportion of mothers in with MUAC of less than 220 mm were 6.6% (4.5 – 9.6, 95% CI). Subsequent analysis taking into account child anthropometric measurement indicated no significant statistical association with this indicators; meaning children from households with mothers having a MUAC value less than 220 mm were neither more nor less likely to be acutely malnourished. The mean maternal MUAC score was 280.1 (276.7 -283.5), Subsequent analyses taking into account anthropometric measurements of children in the household did not show any statistical significant association between these indicators Cf: [Annex 2](#)

The proportion of mothers in SO 13 livelihood zone of Beletweyne district with MUAC of less than 220 mm were 2.8% (1.2 – 6.0, 95% CI). Subsequent analysis taking into account child anthropometric measurement indicated no significant statistical association with this indicators; meaning children from households with mothers having a MUAC value less than 220 mm were neither more nor less likely to be acutely malnourished. The mean maternal MUAC score was 286.6 (285.9 -291.3), subsequent analyses taking into account anthropometric measurements of children in the household indicated a statistical significant association between these indicators, as increased mothers MUAC were associated with increased child WHZ and MUAC scores Cf: [Annex 2](#)

Community Perceptions of Causal Pathways of Undernutrition

The Somali community commonly used words for describing a malnourished child are, '*calool weynad*' (big stomach), '*caata*' (thin), and '*fadhiid*' (not able to walk), while in other communities is called '*maclul*', meaning lack of food, with children who have Kwashiorkor is referred to as, '*calool weynad iyo barar*', directly meaning big stomach and swelling, which are named due to their physical presentation.

Child undernutrition in the IDP livelihood of Kahda is associated as affecting poor households; urban poor and IDPs are identified as higher risk. The community described a malnourished child as being weak, always crying, and thin, having a poor appetite, swollen face and stomach, not playful, with the presence of yellowish hair.

In the agro pastoral livelihood of Baidoa, child undernutrition is a common phenomenon that is well understood. They pointed out that undernutrition commonly affects both women and children, they said the women commonly affected by the condition are pregnant and breastfeeding mothers and children under five years of age. Among the children they pointed out that children less than 2 years were more vulnerable than the rest of the children.

Urbanization was also associated with child nutrition, where women who are in town have adequate time but don't adequately breastfeed their children when they are able. Urban women were also castigated for associating traditional foods like beans, maize and sorghum as food for the poor and preference for foods such as rice, pasta and wheat flour.

In the riverine livelihood zone of Beltweyne District, the community linked child's good nutritional status to parent hard work particularly the mother. This they say enables them purchase essential foods like milk, and other foods.

Malnutrition was also associated with mass sickness, linked to drought and displacement secondary to insecurity and flooding.

"Malnourished children are common during displacement and flooding session. This is because household routine activities and their shelter is interrupted leading to eating and drinking unclean food and water. Temporary shelter expose human to effects of weather especially children who pick up change in environment"

Key informant, Domey, Beltweyne

Child undernutrition in Beletweyne was also associated with to household hygiene:

"Children of 2 - 5 years are likely to get sick and malnourished because children at this age learn to walk, eat whatever they see. They walk out and contaminate themselves,"

Key informant, Domey, Beletweyne

Other respondents in riverine livelihood of Beletweyne suggest that children at the age of 2 years outgrow from the mother intimate care either because the mother has had another child or she actively start engaging in other priority activities including working outside the household. The child misses the compassion and mother's care. This is a child who might not be able to wash hands, not able to keep clean and not able to explain what they feel – hunger or sickness.

Across the four livelihood zone under study, photos of stunted children were not well recognised by the community as a form of malnutrition. It was majorly associated with genetic and hereditary ('siif¹⁰⁰') factors, and the common perception is that the child comes from a family of short people.

5.6.1. Summary of Results and Categorisation of Risk Factors

In order to understand how participating communities, perceive the severity of risk factors to undernutrition, a prioritization exercise was conducted at the end of the qualitative data collection period in each of twelve localities. All risk factors identified by community members over the course of the study were presented back to them with the use of flashcards, portraying each discussed risk factor. After a recapitulation of survey findings by the qualitative data collection team, participants were invited to validate the interpretation of results and suggest modifications, if necessary. Subsequently, they were requested to divide risk factors into three categories (major, important, minor), depending on their impact on child undernutrition. The results of this exercise are presented in the [Table 22](#) with additional columns added for a pooled categorisation by studied livelihood zone/District. Risk factors perceived as having a major impact on undernutrition are highlighted in red, important factors are marked in orange while risk factors with minor impact are coloured green. White cells marked "N/A" signify that a respective community did not identify that risk factor as a cause of undernutrition.

¹⁰⁰ Somali word for congenital condition, or genetic makeup

Table 22: Community rating exercise (all Districts combined)

	Risk factor	L1	L2	L3	L4	D1	L5	L6	L7	L8	D2	L9	L10	L11	L12	D3	L13	L14	L15	L16	D4	
A	Limited availability of quality health services	++	+++	-	++	++	+++	+	+++	+++	+++	+++	+	+++	++	++	+++	+++	+++	+++	+++	+++
B	Limited access to health services/ use of traditional health providers	-	++	++	-	+	+++	+++	+++	+++	+++	-	++	-	-	+	-	-	-	+++	+	
C	Low birth spacing/ unwanted pregnancies	+++	+++	++	++	+++	++	+	+	+	+	+++	+++	++	++	+++	-	+	+	-	+	
D	Parental stress	-	-	-	-	-	+	+	+	-	+	-	-	-	-	-	-	-	-	-	-	
E	Non-optimal breastfeeding practices	++	++	++	++	++	++	++	++	++	++	+++	+++	++	++	++	++	++	+	-	++	
F	Non-optimal IYCF practices	+++	+++	-	++	++	+++	+	+	+	++	+++	++	+++	+++	+++	++	-	++	+	++	
G	Low access to food	+++	+	+	++	++	+	+	+++	++	++	++	-	+	+	+	+++	++	++	++	++	
H	Low diversity/ access/ availability of income sources.	+++	+++	+++	+++	+++	+++	++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
I	Malfunctioning market or supply system	+	-	++	-	+	-	+++	+++	+	++	+	-	++	-	+	+	+	+	+++	++	
J	Low coping capacities/low resilience	+++	+	+++	++	+++	-	++	+++	+	++	+++	+	+++	++	++	-	++	++	++	++	
K	Low access/ availability of water (quality & quantity)	+	++	+++	+++	+++	+++	++	+++	+	++	+	++	+++	+++	++	+++	+++	+++	+++	+++	+++
L	Poor sanitation practices	+	++	N/A	++	+	+++	+	+	++	++	+	++	+++	+++	++	+++	+++	++	+++	+++	+++
M	Women workload	+++	+++	++	+++	+++	++	+++	+	+	++	+++	+++	+++	+++	+++	++	+++	+++	+++	++	+++
N	Low social support for women	+	-	+	-	+	-	+++	++	+	++	+	+	++	++	++	+	-	-	+	+	
O	Low nutritional status of women	-	++	-	+	+	++	+	+	++	++	++	++	++	++	++	++	++	+++	++	++	
P	Migration and evictions	+	++	+++	++	+	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	

Legend:

D1: IDP Settlement, Kahda district	D2: Pastoral LZ, Goldogob District	D3: Agro-pastoral LZ, Baidoa District	D4: Riverine LZ, Beltweyne District
L1: Abadir	L5: Alaale	L9: Komari	L13: Bacaad
L2: Liqliqato	L6: Dar Salam	L10: Wadajir	L14: Bacaadbuke
L3: Omar Fiyasko	L7: Qansahle	L11: Makuda	L15: Domey
L4: Shimbiralle	L8: Xero Jale	L12: Bonkai	L16: Jawil

H	Low access and availability of income sources for households	++	+++	+++	++	++	+	-	+	+	+++	++	+++	++	+++	+++	++	+++	+++	++	++	++	
I	Market functioning or supply system	+	+	+++	+	++	N/A	N/A	N/A	N/A	+	++	+	++	+	++	+	++	+	++	+	++	
J	Low resilience	+++	++	+++	++	+	+++	+++	+++	+++	+++	+++	+++	++	+++	++	++	++	+++	+++	+++	++	
K	Low access and availability of water	+++	+++	+++	+++	++	-	-	-	-	+++	++	++	+++	+++	++	++	+++	+++	++	++	+++	
L	Poor hygiene practices	++	++	+++	+++	++	+++	-	+	-	++	+++	++	+++	+	++	+	+++	++	++	++	++	
M	Women workload	++	+++	++	+++	++	-	-	-	-	+++	++	+++	++	+++	++	+++	+++	+++	+++	++	+++	++
N	Low social support for women or households	+	++	++	+	N/A	+	-	-	+	+	+	+	+	+	++	++	+	+	+	+	+	
O	Low nutritional status of women	+++	++	++	++	+	++	-	-	+	+	++	+	++	+	++	++	++	++	++	++	++	++
P	Migration and Land evictions	N/A	++	++	N/A	N/A	N/A	N/A	N/A	N/A	+	+	N/A	N/A	+	+	N/A	N/A	++	+	+	+	
R	Low quality of interactions between the child and caregiver	++	++	N/A	N/A	++	N/A	+++	++	+	++	+	+	+	+	++	+	+	++	++	++	++	

The weight of each risk factor was determined in line with the rating grid presented (Cf: [Table 24](#)).

Table 24: Rating grid for the categorization of risk factors

Category	Criteria
Major risk factor	No conflicting information AND Strength of association with literature review classified as [++] or [+++] AND Majority of [++] or [+++] for all other sources of information
Important risk factor	A minor amount of contradictory information exists AND Strength of association from literature review is classified as [++] or [+++] AND Majority of [++] or [+++] for all other sources of information
Minor risk factor	A moderate level of contradictory information is permitted AND Strength of association from literature review is classified as [+] or [++] AND Majority of [+] for all other sources of information
Risk factor rejected	Non-contradictory information AND Majority of [-] or [+] for all other sources of information

At the same time, Link NCA Analyst revisited causal pathways of undernutrition, as developed with communities during the qualitative inquiry, and developed four simplified outlines, likely to explain a majority of cases of wasting in each study zone. Most importantly, this exercise allowed to highlight certain differences between causal mechanisms across livelihood zones, which will enable the adaptation and prioritisation of response strategies to observed trends across the studied settings.

[Figure 11](#) below depicts a causal mechanism for SO 19 livelihood zone (settlements for internally displaced populations) in Kahda district, highlighting the risk factors with a significant statistical association with wasting. The most vulnerable group to acute malnutrition were children up to 36 months of age while child's increasing age was identified as a protective factor against wasting. Children residing in settlements less than 6 months were less likely to be wasted although their odds decreased by only approximately 45%. According to the FSNAU datasets, male children were more likely to suffer from acute malnutrition.

A dominant pathway to wasting in SO 19 livelihood zone likely takes its roots in a limited access to income sources, which translates into a limited access to food, triggering inadequate coping strategies with an effect on a dietary intake of women of reproductive age and children under 5 years of age. While job opportunities in and around settlements for displaced populations are scarce and women are particularly vulnerable to mistreatment, children living in households, which declared livestock as their main source of income, were more likely to be wasted. On the other hand, children whose mothers felt supported by their family and acquaintances, and therefore potentially less stressed and with a lesser workload, were less likely to be acutely malnourished.

As a consequence of household's limited access to income, its access to food is likely to be hindered. However, during the Link NCA quantitative survey, children from households reporting an adequate household food provisioning all year, especially children from households residing in

a settlement for more than a year, were more likely to be wasted. This finding being of counter-intuitive nature warrants further research, especially in terms of community engagement during population-based surveys and potential response bias based on predicted programmatic response.

As households perceive food access limitations to meet their daily needs, they are likely to deploy a number of coping strategies, used in a varied sequencing, to overcome a difficult period. According to the Link NCA quantitative survey, children living in households with a higher rCSI score, especially those headed by women, were more likely to be wasted. A similar observation, although without a gender distinction for the head of household, was also noted in the FSNAU datasets. In addition, children were more likely to be wasted if they lived in a household, which consumed cheaper and less preferred foods 3-7 days a week¹⁰¹ and if they lived in a household, which borrowed food 3-7 days a week¹⁰¹. The significant statistical associations for the latter risk factor were particularly observed in female-headed households. Furthermore, children from female-headed households were found to be more vulnerable to acute malnutrition if their households reported reducing meal portions 3-7 days a week¹⁰¹, collected wild foods 3-7 days a week¹⁰¹ or worked for food 3-7 days a week¹⁰¹. Children from all surveyed households, in which meals were reserved only for children 3-7 days a week¹⁰¹, were almost 5 times more likely to be acutely malnourished. Considering the severity of the latter coping strategy, it is possible to infer that respective households experience extreme food insecurity, which demands drastic measures to ensure the survival.

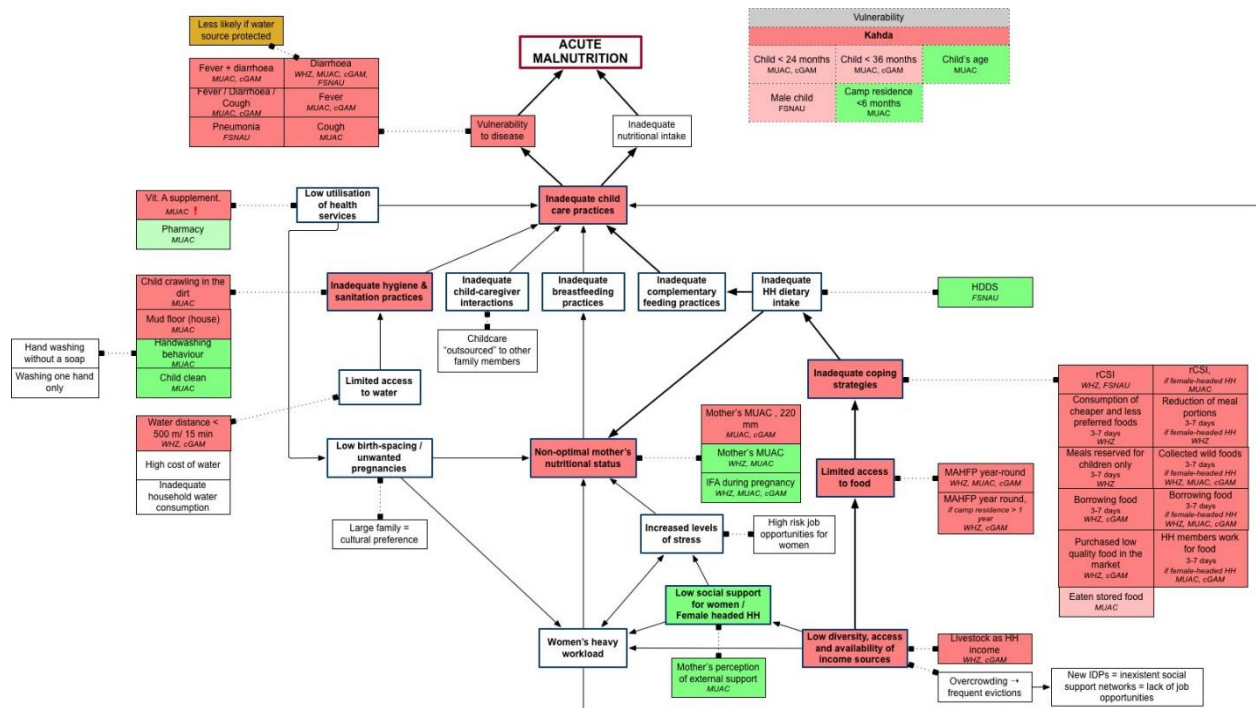


Figure 11: Simplified causal pathway for SO 19 livelihood zone, Kahda District¹⁰²

¹⁰¹ During a 7-day recall period prior to the data collection.

¹⁰² Dark red cells represent risk factors presenting a significant statistical association with acute malnutrition ($p < 0.05$) (See Annex 2). Cells highlighted in light red signify risk factors with a potential link to acute malnutrition ($p < 0.1$) Cells in dark/light green represent protective factors with a significant and/or potential statistical association with acute malnutrition.

As adults, including women of reproductive age, give up meals in favour of their children, their nutritional status may suffer in consequence with a rippled effect on a nutritional status of breastfed children or fetuses, if pregnant. In fact, children of mothers with a mid-upper arm circumference (MUAC) measurement of less than 220 mm were more likely to be wasted while higher MUAC values of mothers were linked with an increase of both WHZ and MUAC values of their children. In addition, children of mothers who received an iron and folic acid supplementation during their pregnancy, were less likely to be wasted. In other words, an optimal nutritional status of women seems to be a protective factor against acute malnutrition in the studied setting.

A complementary pathway to wasting in SO 19 livelihood zone cuts across the water, sanitation and hygiene sector, highlighting the importance of safe water access and adequate hygiene and sanitation practices in a child's illness prevention and an optimal nutritional development. While a distance to a water point have been long proclaimed as a barrier of access to water, children in Kahda living in households in close proximity to water points (less than 500 m or 15 min walking) were more likely to be wasted. It is believed that the counter-intuitiveness of this finding might be linked with a high cost of water, which the household might be unable to cover, as well as long queues at water points, which increase a mother's workload and her absence from the household. Both factors have a compounding effect on a household's inadequate water consumption, if unable to fetch enough water to meet household's needs. This translates into household's inadequate hygiene practices, which increase child's vulnerability to illnesses. Children living in households with mud floors or children observed crawling in the dirt at the time of the data collection were more likely to be wasted. On the other side, children living in households, which demonstrated an adequate handwashing behaviour, or children who were observed clean during the data collection were less likely to be wasted.

Children's vulnerability to diseases demonstrated significant statistical links with acute malnutrition as children suffering from diarrhoea, fever or cough¹⁰³, were more likely to be wasted while their chances of diarrhoea decreased if the household used an improved water point. In addition, children suffering from pneumonia were more likely to be wasted according to the FSNAU datasets. Interestingly enough, children who reportedly received Vitamin A supplementation¹⁰⁴ were more likely to be wasted. The counter-intuitiveness of this finding warrants further research.

Figure 12 below depicts a causal mechanism for SO 05 pastoral livelihood zone in Goldogob district, highlighting the risk factors with a significant statistical association with wasting. Similarly, to SO 19 livelihood zone, the most vulnerable group to acute malnutrition were children up to 36 months of age while child's increasing age was identified as a protective factor against wasting. Children from households, which have resided in the area less than two years, and/or children from households residing in IDP settlements were two to three times more likely to be wasted. According to the Link NCA quantitative data as well as FSNAU datasets, male children were more likely to suffer from acute malnutrition.

A dominant pathway to wasting in SO 05 livelihood zone likely takes its roots in a limited access to income sources, which translates into a limited access to food, triggering inadequate coping strategies with an effect on a dietary intake of women of reproductive age and children under 5 years of age. Children living in households, which waged labour or petty trade as their main source of income, were potentially more likely to be wasted (p-value <0.1). Children from households

¹⁰³ During a 14-day recall period prior to the data collection.

¹⁰⁴ During a 6-month recall period prior to the data collection.

reporting difficulties with an adequate household food provisioning, especially children from households residing in the area for more than a year, were more likely to be wasted.

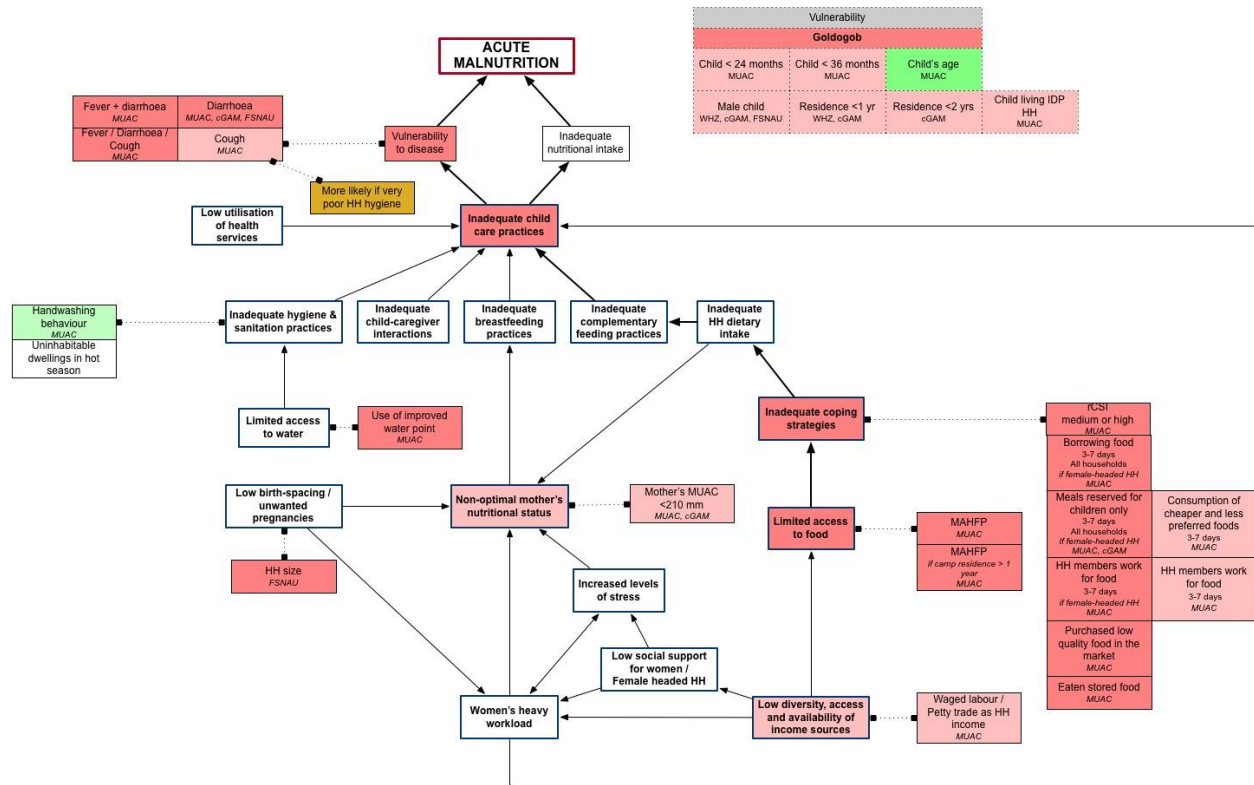


Figure 12: Simplified causal pathway for SO 05 livelihood zone, Goldogob District¹⁰⁵

As households perceive food access limitations to meet their daily needs, they are likely to deploy a number of coping strategies, used in a varied sequencing, to overcome a difficult period. According to the Link NCA quantitative survey, children living in households with a medium to high rCSI score were more likely to be wasted. Children were also more likely to be wasted if they lived in a household, which borrowed food 3-7 days a week¹⁰¹, while their odds increased if they lived in female-headed households. A similar pattern was observed for children living in households, which reserved meals for children 3-7 days a week¹⁰¹, but their odds of being wasted doubled in comparison to a sample of children from all households. As a consequence, children of mothers with a mid-upper arm circumference (MUAC) measurement of less than 210 mm were potentially more likely to be wasted. Children living in female-headed households, the members of which worked for food 3-7 days a week¹⁰¹ were more likely to be acutely malnourished.

A complementary pathway to wasting in SO 05 livelihood zone potentially leads through the water, sanitation and hygiene sector, although the available evidence is scarcer than in the case of SO 19 livelihood zone. While children living in household, which demonstrated an adequate handwashing behaviour, were potentially less likely to be wasted, children living in households using an improved water point were more likely to be wasted. The counter-intuitiveness of this finding might be linked with a high cost of water, which the household might be unable to cover,

¹⁰⁵ Dark red cells represent risk factors presenting a significant statistical association with acute malnutrition ($p < 0.05$) (See Annex 2). Cells highlighted in light red signify risk factors with a potential link to acute malnutrition ($p < 0.1$) Cells in dark/light green represent protective factors with a significant and/or potential statistical association with acute malnutrition.

and/or an unstable access to this water point caused by repairs or maintenance, during which a household looks for other, mostly unprotected water sources, to cover its daily needs.

Children's vulnerability to diseases demonstrated significant statistical links with acute malnutrition as children suffering from diarrhoea or fever and diarrhoea¹⁰⁶ were more likely to be wasted. Children suffering from cough were potentially more likely to be wasted (p-value <0.1) while their chances of cough increased in households with a poor hygiene¹⁰⁷. Based on the community feedback describing their dwelling uninhabitable during the hot season due to high temperatures it would be interesting to study this potential relationship further.

Figure 13 below depicts a causal mechanism for SO 15-16 agro-pastoral livelihood zone in Baidoa district, highlighting the risk factors with a significant statistical association with wasting. Similarly, to SO 19 and SO 05 livelihood zones, the most vulnerable group to acute malnutrition were children up to 36 months of age while child's increasing age was identified as a protective factor against wasting. Children from female-headed households were more than two times more likely to be wasted. According to the FSNAU datasets, male children were more likely to suffer from acute malnutrition.

A dominant pathway to wasting in SO 15-16 livelihood zone imitates previously discussed pathways, although the available evidence is less consistent than in case of SO 19 and SO 05 livelihood zones. It also likely takes its roots in a limited access to income sources, which translates into a limited access to food, triggering inadequate coping strategies with an effect on a dietary intake of women of reproductive age and children under 5 years of age. Children living in households, which declared agriculture as their main source of income, were potentially more likely to be wasted (p-value <0.1), likely due to recurrent droughts with a rippled effect on the agricultural production. Children from households, which reported a more stable access to food (MAHFP), especially children from households residing in the area for more than a year, were less likely to be wasted and, therefore, an adequate access to food can be categorised as a protective factor against acute malnutrition in the studied area.

However, as households perceive food access limitations to meet their daily needs, they are likely to deploy a number of coping strategies, used in a varied sequencing, to overcome a difficult period. According to the Link NCA quantitative survey, children living in households with a higher rCSI score, especially those headed by women, were potentially more likely to be wasted (p-value <0.1). A similar observation, although without a gender distinction for the head of household, was also noted in the FSNAU datasets while the statistical significance was stronger (p-value <0.05). In addition, children were more likely to be wasted if they lived in a household, which borrowed food 3-7 days a week¹⁰¹ or collected wild foods 3-7 days a week¹⁰¹. The latter observation was applicable to all households in the sample as well as female-headed households only, while children's odds of being wasted did not change substantially. Children were also more likely to be wasted, if they lived in households, which reserved meals only for children 3-7 days a week¹⁰¹. Children living in households, which reduced meal portions 3-7 days a week¹⁰¹ or purchased food on credit 3-7 days a week¹⁰¹ were potentially more likely to be wasted (p-value <0.1).

In case an adequate food access is possible, an increase in dietary diversity score (IDDS) suggested an increase in child's WHZ while an acceptable IDDS score lowered child's odds of wasting. In contrast, the analyses based on the FSNAU datasets seem to suggest that a consumption of iron

¹⁰⁶ During a 14-day recall period prior to the data collection.

Figure 14 below depicts a causal mechanism for SO 13 riverine livelihood zone in Beltweyne district, highlighting the risk factors with a significant statistical association with wasting. The most vulnerable group to acute malnutrition were children up to 24 months of age while children from households, which have resided in the area less than one year, were less likely to be wasted. Children up to 36 months seemed to be more likely to be wasted by MUAC but less likely to be wasted by WHZ. For all children 6-59 months, a reverse relationship was noted for child's age as the increasing age was linked with a decreasing WHZ but increasing MUAC.

A dominant pathway to wasting in SO 13 livelihood zone imitates previously discussed pathways and likely takes its roots in a limited access to income sources, which translates into a limited access to food, triggering inadequate coping strategies with an effect on a dietary intake of women of reproductive age and children under 5 years of age. Children living in households, which declared agriculture and waged labour/petty trade as their main source of income, were potentially less likely to be wasted (p-value <0.1), suggesting a protective effect of income on a nutritional status of children.

An interesting relationship was observed in relation to the perception of external support, meaning that children of mothers who perceived little external support were more likely to be wasted while children in female-headed households receiving sufficient level of external support, and therefore potentially less stressed and with a lesser workload, were less likely to be wasted.

As a consequence of household's limited access to income, its access to food is likely to be hindered. However, during the Link NCA quantitative survey, children from households reporting an adequate household food provisioning all year, especially children from households residing in a settlement for more than a year, were more likely to be wasted by WHZ but they were less likely to be wasted by MUAC. This finding being of counter-intuitive nature warrants further research, especially in terms of body proportion differences in Somali children with an effect on the sensitivity of anthropometric methods to detect malnutrition as well as in terms of community engagement during population-based surveys and potential response bias based on predicted programmatic response.

As households perceive food access limitations to meet their daily needs, they are likely to deploy a number of coping strategies, used in a varied sequencing, to overcome a difficult period. According to the Link NCA quantitative survey, children living in households with a higher rCSI score were more likely to be wasted. In addition, children were more likely to be wasted if they lived in a household, which consumed cheaper and less preferred foods 3-7 days a week¹¹¹ or in which meals were reserved only for children 3-7 days a week¹⁰¹. The latter risk factor considered the most severe coping strategy, inferring that respective households experience extreme food insecurity, mother's nutritional status with a rippled effect on a nutritional status of her children takes a toll. In contrast, higher MUAC values of mothers were linked with an increase of both WHZ and MUAC values of their children while comparable findings were also recorded for the FSNAU datasets.

In case an adequate food access is possible, an increase in dietary diversity score (IDDS) suggested an increase in child's WHZ. In contrast, the analyses based on the FSNAU datasets seem to suggest that a consumption of iron rich foods during a 24h as well as a 7-day recall period prior to the data collection increase child's chances of wasting. The counter-intuitiveness of this finding warrants further research.

¹¹¹ During a 7-day recall period prior to the data collection.

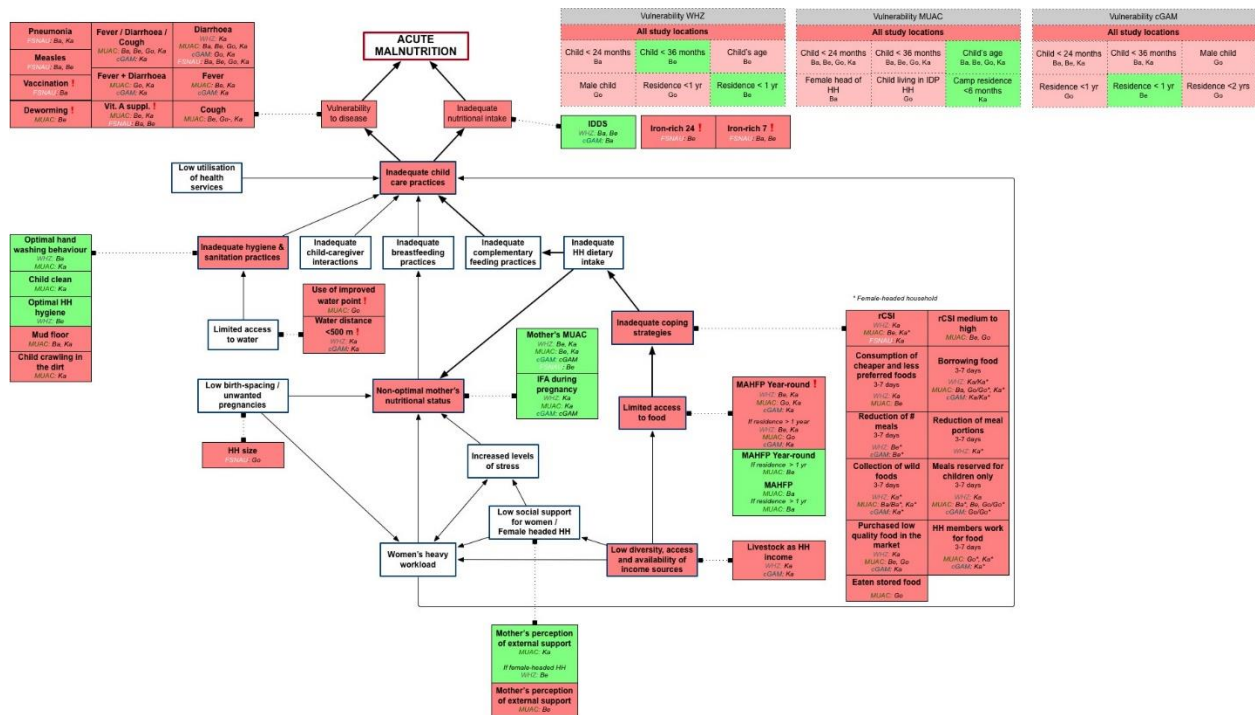


Figure 15: Simplified causal pathway for all studied settings (SO 05, SO 13, SO 15-16, SO 19)¹¹⁵

Based on the available data, children's general vulnerability to acute malnutrition per WHZ could not be established as risk factors vary substantially across four livelihood zones. Child's age seems to play a role in SO 15-16 and SO 13 while its negative or positive effect on child's nutritional status was not confirmed in other locations. On the other hand, sex of a child and residence <1 year seem to play a role in SO 05 while their effect was not confirmed in other livelihood zones. Other risk factors, which demonstrated a significant statistical association with wasting per WHZ, include optimal handwashing behaviour (SO 15-16), optimal household hygiene (SO 13), mother's MUAC (SO 13 and SO 19) and inadequate coping strategies (SO 13 and SO 19). In other words, agro-pastoral and riverine livelihood zones indicate a potential weakness in the water, hygiene and sanitation sector while settlements for internally displaced populations in Kahda District experience important household resilience challenges with an effect on nutritional status of women in reproductive age and children under 5 years of age.

Children's vulnerability to acute malnutrition per MUAC showed a numbers of overlaps, indicating that child's age (up to 36 months) is negatively associated with wasting per this variable in all studied settings. Children living in female-headed households are more vulnerable to acute malnutrition per MUAC only in SO 15-16 while children living in IDP households showed an increased vulnerability in SO 05. Other risk factors, which demonstrated a significant statistical association with wasting per MUAC, include mud flooring (SO 15-16 and SO 19), child crawling in the dirt (SO 19), mother's MUAC (SO 13 and 19) and inadequate coping strategies (all livelihood zones). Out of these, borrowing food (SO 05, 15-16 and SO 19), collection of wild foods (SO 15-16 and SO 19) and meals reserved for children (SO 13, SO 15-16 and SO 19) were deployed across most settings and hence suggest important household resilience challenges with an effect on

¹¹⁵ Dark red cells represent risk factors presenting a significant statistical association with acute malnutrition (p < 0.05) (See Annex 2). Cells in dark green represent protective factors with a significant statistical association with acute malnutrition.

nutritional status of women in reproductive age and children under 5 years of age. It is also important to note that a significant association between wasting per MUAC and diarrhoea was observed across all four settings while cough demonstrated a negative effect in SO 05, SO 13 and SO 19 and fever in the latter two.

Considering a combined variable cGAM, children under 24 months appear to be more vulnerable to wasting in SO 13, SO 15-16 and SO 19 while the vulnerability of children up to 36 months is restricted to only two settings (SO 15-16 and SO 19). Other similarities across studied settings were not observed. Other risk factors, which demonstrated a significant statistical association with wasting per cGAM, include mother's MUAC, borrowing food (SO 19) and meals reserved for children (SO 05). It is also important to note that a significant association between wasting per cGAM and diarrhoea was observed in SO 05 and SO 19 while fever demonstrated a negative effect in SO 19.

6.0. Conclusion and Recommendations

The analyses undertaken during this Link NCA study allowed to identify nine (9) risk factors, believed to have an impact on the incidence of undernutrition in the study zone. Following a triangulation of data from diverse sources, two (2) risk factors were identified as having a major impact in SO 15-16 agro-pastoral livelihood zone in Baidoa district, one (1) risk factors were identified as having a major impact in SO 13 riverine livelihood zone in Beltweyne district, two (2) risk factors were identified as having a major impact in SO 05 pastoral livelihood zone in Goldogob district and four (4) risk factors were identified as having a major impact in SO 19 livelihood zone (IDP settlements) in Kahda district. Furthermore, ten (10) risk factors were classified as having an important impact in SO 15-16 agro-pastoral livelihood zone in Baidoa district, ten (10) risk factors were identified as having important impact in SO 13 riverine livelihood zone in Beltweyne district, nine (9) risk factors were identified as having important impact in SO 05 pastoral livelihood zone in Goldogob district and ten (10) risk factors were identified as having an important impact in SO 19 livelihood zone (IDP settlements) in Kahda district, while the remaining four (4), six (6), five (5) and three (3) risk factors were judged to have a minor impact on the incidence of undernutrition in SO 15-16 livelihood zone of Baidoa, SO 13 livelihood zone of Beltweyne, SO 05 livelihood zone of Golodgob district and SO 19 livelihood zone of Khada district respectively.

Risk factors to child undernutrition SO 19 livelihood zone of Kahda District

In the SO 19 livelihood zone of Kahda district, among the major risk factors deemed to responsible for child acute malnutrition are: low access and availability of income sources for households, low household resilience, low access to household water and women workload.

Important risk factors identified in SO 19 livelihood zone of Kahda include; low access to health centres / use of traditional care, low utilization of health services/ low use of health services, low birth spacing/ unwanted pregnancies, non-optimal breastfeeding, poor child feeding practices, low access to food, low nutritional status of women, migration and land eviction, low quality of interaction between child and caregiver and poor hygiene practices.

Minor risk factors in the SO 19 livelihood zone were: caregiver stress, market functioning or supply system and low social support for women or households.

Risk factors to child undernutrition SO 05 livelihood zone of Goldogob District

In the SO 05 livelihood zone of Goldogob district, among the major risk factors deemed to responsible for child acute malnutrition are: low access to health centres / use of traditional care and low household resilience.

Important risk factors identified in SO 05 livelihood zone of Goldogob district include; low utilization of health services/ low use of health services, low birth spacing/ unwanted pregnancies, poor child feeding practices, low access to food, low access and availability of income sources for households, low access and availability of water, poor hygiene practices, women workload, low nutritional status of women.

Minor risk factors in the SO 05 livelihood zone of Goldogob were: caregiver stress, non-optimal breastfeeding practices, market functioning or supply system, low social support for women or households, migration and land evictions, low quality of interactions between the child and caregiver.

Risk factors to child undernutrition SO 15-16 livelihood zone of Baidoa District

In the SO 15-16 livelihood of Baidoa district, among the major risk factors deemed to responsible for child acute malnutrition are: low household resilience and women workload.

Important risk factors identified in SO 15-16 livelihood zone of Baidoa district include; low access to health centres / use of traditional care, low utilization of health services/ low use of health services, low birth spacing/ unwanted pregnancies, non-optimal breastfeeding practices, poor child feeding practices, low access to food, low access and availability of income sources for households, low access and availability of water, poor hygiene practices and low nutritional status of women.

Minor risk factors in the SO 15-16 livelihood zone of Baidoa were: caregiver stress, market functioning or supply system, low social support for women or households, migration and land evictions low quality of interactions between the child and caregiver.

Risk factors to child undernutrition SO 13 livelihood zone of Beletweyne District

In the SO 13 livelihood zone of Beletweyne district, among the major risk factors deemed to responsible for child acute malnutrition are: Low access and availability of water.

Important risk factors identified in SO 13 livelihood zone of Beletweyne district include; low access to health centres / use of traditional care, non-optimal breastfeeding practices, poor child feeding practices, low access and availability of income sources for households, market functioning or supply system, low resilience, poor hygiene practices, women workload, low nutritional status of women and low quality of interactions between the child and caregiver

Minor risk factors in the SO 13 livelihood zone of Beletweyne district were: low utilization of health services/ low use of health services, low birth spacing/ unwanted pregnancies, caregiver stress, low access to food, low social support for women or households and migration and land evictions.

Similarities across SO 19, SO 05, SO 15-16 and SO 13 livelihood zone of Kahda, Goldogob, Baidoa and Beletweyne districts

An analysis of similarities in major risk factors identified in the four livelihood zones revealed that lack of household resilience was a major factor cutting across all livelihood zones where it was rated as a major factor in SO-19, SO 05, and SO 15-16. of Kahda IDP, Pastoral Livelihood of Goldogob and Agropastoral Livelihood zone of Baidoa respectively. In the SO 13 Riverine Livelihood of Beletweyne district lack of household resilience was categorised as an important risk factor. The low household resilience across the livelihood zones could be attributed to low household incomes which expose households to employ coping mechanism to access food.

Low access to availability of water was identified a major risk factor in SO 19 and SO 13. This was identified an important factor in SO 05 of Goldogob district. In SO 19 livelihood zone of Kahda, Long queues at water points as well as high cost of water was mentioned while in SO 13, despite river Shabelle going through Beletweyne, the water was contaminated upstream, thus households depended on water bowsers. The frequent flooding experience in Beletweyne was mentioned to have destroyed water infrastructure.

Women workload was identified as a major risk factor in SO 19 of Kahda and SO 15-16 livelihood zones Baidoa. In Kahda, the women workload is attributed to women engaged in casual labour activities for livelihood as well as household chores which reduces mothers' time for child care. In SO 15-16 livelihood zone, mothers were engaged in farm labour activities as well as household responsibilities. It was noted that in SO 15-16 livelihood zone, the workload was seasonal during planting, weeding and harvesting while in SO-19 livelihood zone, it was throughout the year.

The calculation of statistical associations between individual risk factors and nutritional status of children in surveyed households allowed to differentiate between the causal mechanisms of wasting for each livelihood zone while all findings were compiled in an overarching causal pathway, detailing generally applicable mechanisms across all studies settings. Based on these findings, the following activities are thus recommended to be considered for an incorporation into current/future interventions.

Key Recommendations

Based on these findings, the following activities, per livelihood zone are thus recommended to be considered for an incorporation into current/future interventions.

Global Recommendations

- Invest in early warning early action give population's alerts on possible risks to their livelihood to reduce the impact income sources and enhance community and household resilience.
- Investment on transformative capacities and governance at livelihood level in management of rangelands and water management points through improvement in access to water through construction of new and/or maintenance of existing water points using existing structures and mechanisms to ensure their proper long-term utilization by investing in water management systems involving communities.
- Enhance, technical trainings to population to ensure their skills match market demand as way to increase employment opportunities for household members thus increasing household income.
- Government and partners to invest in building adaptive and absorptive capacities through investments projects such as agriculture and livestock, business enterprises etc.

- Investing in ecosystem management: Rangeland, and water systems in respective communities.
- Encourage market based programming focusing on value chain approach from production to market access.
- Minimize child exposure to disease pathogens by improving on household hygiene practices to include child care practices, such as child cleaning, ensuring safe child playing environments.
- Enhancing adequate water access by household to facilitate tagine practices

SO 19 livelihood Zone of Kahda district

- Government and partners encourage diversification of income sources by creation of income generation activities, providing technical training skills that match the job market to increase population chances of being engaged in meaningful income generating activities.
- Designing programs to cushion household against impact of high sea tide when there is reduced casual labour activities leading to household loss of income.
- Enhancing household water access by repairing non- functional water points and reduce walking distance and long queues.
- Ensuring gaining child playing environment at household as well as providing young children with mats to crawl on to avoid contamination as they crawl on unhygienic environments.
- Ensuring improved mothers nutritional status, by providing mothers with alternative livelihoods and reducing workload which will in turn reduce child malnutrition.
- Designing of health facility opening hours to fit the working schedule of the IDPs mothers. This will facilitate access to health care during child illness.

SO 19 livelihood zone of Goldogob district

- Ensuring access to healthcare by introduce more health facilities and more consistent outreach services to provide health services for the people living hard to reach area.
- To improve the low resilience, there is need for environmental conservation/reforestation and range management, Livestock restocking as well as create small scale business for pastoral drop outs. This will in turn increase household income and reduce coping mechanism.
- Increase household access to clean water sources to reduce water related diseases such as diarrhea as well as improve household hygiene practices.
- Cushion household against food access challenges, more so the Pastoral dropout –IDPs
- Design livestock restocking programs to the most affected households to improve their incomes and food access
- Reduce child exposure to disease by encouraging hygienic child playing environment.

SO 15-16 livelihood zone of Baidoa district

- Investment in small and large scale agricultural production investment, to include Livestock restocking and diversification of Income sources to include Formal/informal education and vocational trainings to have skills matching the market demand.
- Reduce reliance on rain fed agriculture which is affected by cyclic droughts hence reducing household access to income and food.
- Enhance or improve access to healthcare by households away from Baidoa by establishing outreach centers or new health facilities
- Designing household hygiene and sanitation promotion programs to reduce hygiene related illnesses.

- Establish a market driven farming to ensure farm produce gets markets as well as addressing the production and market access bottlenecks in the district.

SO-13 livelihood zone of Beletweyne district.

- Ensuring household adequate access to clean water through establishing new water sources (shallow wells) to protect/limit the impacts of river flooding as well as reestablishing broken water systems due to flooding or any other factors.
- Investment in shallow water infrastructure multi-use system to reduce on time wastage queuing and also improve on water hygiene.
- Increase utilization of health facilities by households through establishing new health facilities or outreach centers.
- Ensuring household hygiene is enhanced to reduce exposure of disease pathogens to children through dirty environment.

Annexes

Annex 1: Quantitative sampling framework (risk factor survey and anthropometric data collection)

SO 15-16 Baidoa District		SO 05 Goldogob District		SO 19 Kahda District		SO 13 Beltweyne District	
Geographical unit	Cluster	Geographical unit	Cluster	Geographical unit	Cluster	Geographical unit	Cluster
Gooyaale	1	Qansahle A	1	Asal	1	Bacaad Buko	1
Misgaale	2	Qansahle B	2	Sastur Alle	2	Hilo Kelyo(A)	2
Irwerka	3	Barin	3	Xareed	3	Hilo Kelyo(B)	3
Buula Maalang	4	Nugaal givin A	4	Horyaal	4	Hilo Kelyo(C)	4
Salbuuy	5	Nugaal givin b	5	Ceelgaras	5	Bacad (A)	5
Salaamey L1	6	Gaani	6	Siimow	RC	Bacad(B)	6
Salaamey L3	7	Riigomane A	7	Dur Dur	RC	Bacad(C)	7
Salaamey L5	8	Riigomane B	8	Baari dheere 3	RC	Baaslaawe	8
Wadajir L1	9	Riigomane C	9	Jaziiro	6	Lafoole	RC
Wadajir L3	10	Daarasalaam A	10	Katiyo	7	Garaash	9
Wadajir L5	11	Daarasalaam B	11	lfiye	8	Qooqane	10
H/wadag L1	12	Daarasalaam C	12	Waldayna	9	Shiniile	11
H/wadag L2	13	Daarasalaam D	13	Xaqiiq	10	Leebow-A	12
H/wadag L4	14	Daarasalaam E	14	iimaansade	11	Leebow-B	RC1
H/wadag L5	15	Daarasalaam F	15	Maayo mUrug	12	Leebow-C	RC2
H/wadag L6	16	Ina xuuraan	16	Buulo Siimow	13	Biyo_qurun-A	13
Isha L2	17	Laanmadow A	17	Barxad wayne	14	Biyo_qurun-B	14
Isha L3	18	Laandheere	18	Labatanjirow	15	Dhariyow-A	15
Isha L4	19	Tuurdibi A	19	Juuqlawe	16	Dhariyow-B	16
Isha L7	20	Tuurdibi B	20	Buufow	17	Dhariyow-B	17
Berdale L1	21	Tuurdibi C	21	Boqolsoon	18	Dhariyow-B	18
Berdale L3	22	Kuwayd A	22	Daacad	RC	Dooligal-A	19
Berdale L5	23	Kuwayd B	23	Midnimo	19	Dooligal-B	20
Adada L1	24	Kuwayd C	24	Cawaale	20	Dooligal-C	21
Adada L3	25	Ahmad Khayr	25	Gor gor	21	Dooligal-D	22
Adada L5	26	Xamure	26	Gal Xagar	22	Dooligal-E	23
Adada L6	27	Booraan cad	27	Mushaani	23	Dooligal-F	24
Waberi L2	28	Gaafaa	28	Ar-waax	24	Dooligal-G	25

Waberi L4	29	Yasin abdule	29	Siimow	25	Hoodley-A	26
Darusalam L3	30	Dhoqoshay	30	afgoye	RC	Hoodley-B	27
Darusalam L5	31	Taaloole	31	Galayr	26	Hoodley-C	28
Horseed L1	32	Jirde	32	khobey	27	Hoodley-D	29
Horseed L3	33	Jaamacwaal	33	Maandeeq	28	Hoodley-E	30
Horseed L4	34	Dhoorey	34	Hodman	29	Hoodley-F	31
Horseed L5	35	Dalsan A	35	Barwaqo	30	Hoodley-G	32
Isha L6	RC	Xerojaale	36	Xusno	31	Bulo-Kahin	33
Berdale L4	RC	Kalabayr	37	Buule	32	Baladu Nour - A	34
Berdale L6	RC	Isgoyska	38	malaka shinida	33	Baladu Nour - B	35
Darusalam L1	RC	kimis	39	shangani	34	Baladu Nour- C	RC
		laan ashkiro	40	Alikofi	35	Bulo-Xubey	36
		Saxa A	41	Hogol	36	Bilisdid-A	37
		Saxa B	42	Alla magan	37	Bilisdid-B	RC
		Qansahle C	RC1	Ali kasi	38	Bilisdid-C	38
		Riigomane D	RC2	Galayr	39	Ceel-Jalle-A	39
		Laanmadow B	RC3	Farxani	40	Ceel-Jalle-B	40
		Saxa C	RC4	Xamari	41	Ceel-Jalle-C	41
		Dalsan B	RC5			Ceel-Jalle-D	42

Annex 2: Calculations of statistical associations between hypothetical risk factors and anthropometric measurements of children in sampled households

A. SO 19, Kahda district

Risk factor <i>Logistics regression-SO 19, IDP Settlement, Kahda</i>					Wasting : WHZ <-2 <i>Children 6-59 months</i>		Wasting: MUAC <125 mm <i>Children 6-59 months</i>		cGAM ¹¹⁶ <i>Children 6-59 months</i>	
Indicator	N ¹¹⁷	n	Prevalence [95% CI]	Design effect	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]
Male child	817	418	51.2[47.7-54.5]	1.0	0.224	1.31[0.85-2.02]	0.396	0.81[0.49-1.32]	0.920	1.02[0.70-1.49]
Age group <24 months ¹¹⁸	817	340	41.6[38.9-44.4]	0.6	0.100	1.44[0.93-2.21]	0.000	14.45[6.53-32.01]	0.000	2.73[1.85-4.03]
Age group <36 months ¹¹⁹	817	533	65.2[62.5-67.9]	0.7	0.725	1.09[0.69-1.71]	0.000	9.52[3.43-26.41]	0.006	1.82[1.18-2.81]
Residence < 6 months	817	256	31.3[27.7-35.2]	1.4	0.739	0.92[0.58-1.48]	0.011	0.44[0.23-0.83]	0.129	0.72[0.47-1.10]
Head of household (F)	817	174	21.3[17.7-25.4]	1.8	0.622	0.87[0.51-1.50]	0.291	0.70[0.36-1.36]	0.221	0.73[0.45-1.20]
Household no main source of income	817	132	16.2[13.1-19.8]	1.7	0.234	0.67[0.35-1.30]	0.316	0.68[0.32-1.45]	0.050	0.55[0.30-1.00]
Household income: Waged labor/ petty trade	817	622	76.1[71.9-79.9]	1.9	0.790	1.07[0.64-1.79]	0.707	1.12[0.62-2.03]	0.958	1.01[0.65-1.58]
Household income: permanent job	817	397	4.8[3.1-7.4]	2.1	0.652	1.25[0.47-3.30]	0.334	1.61[0.61-4.26]	0.286	1.55[0.69-3.49]
Household income: Livestock	817	227	2.7[1.4-5.1]	2.4	0.025	3.00[1.15-7.88]	0.898	1.10[0.25-4.81]	0.011	3.17[1.30-7.73]
Household income: Agriculture	817	154	1.8[0.8-4.0]	2.4	Perfect collinearity					
Measles vaccine : Confirmed by card ¹²⁰	735	626	8.4[3.7-18.0]	10.5	0.172	1.65[0.80-3.40]	0.346	0.50[0.12-2.12]	0.369	1.37[0.69-2.73]
Measles vaccine : Confirmed by card and/or Mother Recall ¹²¹	735	536	72.9[64.7-79.9]	5.3	0.206	0.72[[0.4-1.19]	0.708	0.88[0.45-1.72]	0.499	0.85[0.54-1.35]
BCG	817	613	75.0[71.4-78.3]	1.3	0.644	0.89[0.55-1.45]	0.226	1.47[0.79-2.75]	0.531	1.15[0.74-1.81]
Measles and BCG	735	626	8.4[3.7-18.0]	10.5	0.172	1.65[0.80-3.40]	0.346	0.50[0.12-2.12]	0.369	1.37[0.69-2.73]
Vitamin A supplementation, past 6 months, children 6-12 months	987	437	43.9[36.2-51.9]	0.6	0.722	0.83[0.31-2.27]	0.016	2.74[1.21-6.20]	0.039	2.32[1.0-5.13]
Vit A supplementation, past 1 year, children 12-59 months	697	387	55.5[45.5-65.2]	6.9	0.651	1.12[0.68-1.84]	0.040	2.49[1.04-5.94]	0.273	1.30[0.81-2.08]
Deworming	719	332	46.2[37.4-55.2]	5.7	0.779	1.07[0.66-1.73]	0.773	0.90[0.44-1.84]	0.478	1.18[0.75-1.84]
Diarrhea [2 previous weeks]	817	607	7.3[5.7-9.5]	1.1	0.015	2.25[1.17-4.33]	0.000	5.18[2.77-9.68]	0.000	3.41[1.95-5.98]
<i>If diarrhea-treated with ORS and/or Zinc</i>	587	388	65.5[51.3-77.4]	1.1	0.435	0.59[0.16-2.19]	0.837	1.14[0.33-3.88]	0.890	0.92[0.30-2.88]
Fever [2 previous weeks]	817	124	15.2[12.6-18.2]	1.3	0.390	1.28[0.73-2.25]	0.000	4.28[2.52-7.25]	0.000	2.28[1.45-3.58]
Fever AND Diarrhea	817	244	2.9[2.0-4.4]	1.1	0.186	1.97[0.72-5.38]	0.000	5.72[2.37-13.78]	0.008	3.14[1.36-7.27]

¹¹⁶ Wasting by WHZ and/or MUAC and/or edema (n=0 for Kahda)

¹¹⁷ Children 6-59 months.

¹¹⁸ All ages estimated.

¹¹⁹ All ages estimated.

¹²⁰ 9-59 months.

¹²¹ 9-59 months.

Cough [2 previous weeks]	81 7	77	9.4[7.4-11.9]	1.2	0.60 9	1.20[0.59-2.43]	0.006	2.52[1.32-4.85]	0.301	1.37[0.75-2.50]
Fever OR Diarrhea OR cough	81 7	19 7	24.1[21.1-27.4]	1.1	0.10 3	1.48[0.92-2.37]	0.000	5.16[3.10-8.58]	0.000	2.44[1.64-3.63]
Health seeking in a facility	20 6	12 5	60.7[53.1-67.8]	1.2	0.88 4	1.06[0.48-2.37]	0.562	1.24[0.60-2.53]	0.315	1.40[0.72-2.72]
Pharmacy	20 6	25	12.1[7.8-18.4]	1.3	0.33 1	0.48[0.11-2.13]	0.068	0.15[0.02-1.15]	0.106	0.36[0.10-1.25]
Traditional care and/or home remedy	20 6	2	1.0[0.2-3.9]	0.9	Perfect collinearity					
No treatment sought	20 6	57	27.7[21.4-35.0]	1.2	0.61 0	1.25[0.53-2.92]	0.417	1.36[0.65-2.86]	0.969	1.01[0.50-2.06]
Child ever breastfed, 6-24 months	31 7	27 4	88.3[82.7-92.3]	2.1	0.81 3	0.90[0.38-2.16]	0.602	1.26[0.53-2.97]	0.990	1.00[0.48-2.10]
Continuation of breastfeeding at 1 year ¹²²	45	26	57.8[41.7-72.3]	1.1	0.35 4	0.50[0.11-2.19]	0.109	0.28[0.06-1.32]	0.179	0.39[0.10-1.54]
Acceptable IDDS score ¹²³	31 3	34	10.9[7.2-16.1]	1.5	0.96 1	1.03[0.37-2.81]	0.954	0.97[0.38-2.47]	0.916	0.96[0.41-2.21]
IDDS Score Zero	31 3	69	22.0[14.2-32.6]	3.8	0.85 0	1.08[0.50-2.31]	0.424	0.74[0.35-1.55]	0.997	1.00[0.53-1.89]
Minimum Meal Frequency Adequate	27 4	13 7	50.0[39.5-60.5]	3.0	0.96 0	0.98[0.49-1.95]	0.711	0.89[0.48-1.65]	0.619	0.87[0.50-1.52]
Child clean	81 0	28 3	34.9[31.7-38.3]	1.0	0.59 4	1.13[0.72-1.77]	0.000	0.25[0.12-0.52]	0.314	0.81[0.54-1.22]
MUAC of mother <220 mm	68 9	18	2.6[1.3-5.2]	2.3	0.14 4	2.34[0.75-7.29]	0.037	3.38[1.07-10.63]	0.041	2.85[1.05-7.77]
MUAC of mother < 210 mm	68 9	3	0.4[0-1.8]	1.7	Perfect collinearity		0.158	5.71[0.51-63.90]	0.409	2.76[0.25-30.73]
Mother of child currently pregnant or breast-feeding	70 7	49 4	70.0[65.0-74.3]	1.9	0.49 1	0.84[0.51-1.38]	0.197	0.69[0.40-1.21]	0.369	0.82[0.53-1.26]
Prenatal consultation- at least one consultation ¹²⁴	52 4	42 3	80.7[75.9-84.8]	1.7	0.28 5	0.70[0.37-1.34]	0.748	1.14[0.51-2.52]	0.681	1.14[0.61-2.12]
IFA during pregnancy	46 8	37 1	79.3[74.2-83.6]	1.6	0.00 0	0.25[0.14-0.46]	0.009	0.40[0.20-0.80]	0.000	0.36[0.21-0.63]
Mother has no source of income ¹²⁵	81 7	32 5	39.8[35.4-44.4]	1.8	0.98 4	1.00[0.65-1.56]	0.925	0.98[0.59-1.62]	0.603	0.90[0.61-1.33]
Maternal income: Livestock, agriculture, or fishing	81 7	8	0.9[0.2-3.3]	1.9	Perfect collinearity					
Maternal income: Employee (salaried) or merchant/ trader	81 7	34	4.2[2.6-6.7]	2.1	0.13 5	0.22[0.03-1.61]	0.960	1.03[0.31-3.46]	0.469	0.68[0.23-1.95]
Maternal income: Casual labor, petty trade, and/or firewood	81 7	44 5	54.5[49.9-58.9]	1.7	0.34 1	1.24[0.80-1.92]	0.729	1.09[0.66-1.79]	0.241	1.28[0.86-1.84]
Mother perceived external support: Highest	78 2	21 5	27.5[24.1-31.2]	1.3	0.56 0	0.86[0.51-1.44]	0.047	0.51[0.26-0.99]	0.203	0.74[0.47-1.18]
Reduced coping strategies index: Medium or high	80 9	19 8	24.5[21.0-28.3]	1.5	0.11 0	1.47[0.92-2.36]	0.058	0.51[0.26-1.02]	0.720	1.08[0.70-1.67]
Consumption of Cheaper and Less Preferred Foods - 3 of 7 Days	81 7	23 3	28.5[25.6-31.7]	1.0	0.02 0	1.70[1.09-2.66]	0.333	1.30[0.77-2.19]	0.063	1.46[0.98-2.18]
Head of household F	17 4	55	31.6[24.0-40.3]	1.3	0.40 8	0.61[0.19-1.96]	0.704	1.28[0.36-4.57]	0.700	0.82[0.30-2.23]
Borrowing of food - 3 of 7 Days	81 7	11 0	13.5[10.7-16.9]	1.7	0.04 5	1.75[1.01-3.04]	0.194	1.53[0.81-2.89]	0.035	1.70[1.04-2.78]

¹²² Children 12-15 months

¹²³ At least four food groups

¹²⁴ Only asked to mothers with children < 2 years old

¹²⁵ Asked to all children, regardless of if their mother was in the home.

<i>Head of household F</i>	17 4	31	17.8[11.6-26.4]	1.6	0.01 6	3.62[1.27-10.32]	0.003	6.58[1.86-23.21]	0.016	3.32[1.25-8.85]
Reducing the portion of meals - 3 by 7 days	81 7	93	11.4[8.8-14.7]	1.8	0.00 9	2.13[1.21-3.77]	0.950	1.02[0.47-2.21]	0.148	1.50[0.87-2.58]
<i>Head of household F</i>	17 4	22	12.6[7.0-21.8]	2.0	0.14 9	2.46[0.72-8.40]	0.128	3.00[0.73-12.34]	0.311	1.86[0.56-6.19]
Children-only meals - 3 to 7 days	81 7	14 2	17.4[14.3-21.0]	1.6	0.38 8	1.27[0.74-2.18]	0.959	1.02[0.53-1.95]	1.000	1.00[0.61-1.65]
<i>Head of household F</i>	17 4	31	17.8[11.2-27.1]	1.8	0.52 3	1.47[0.45-4.85]	0.018	4.57[1.29-16.12]	0.169	2.07[0.73-5.85]
Reducing number of meals in the day- 3 to 7 days	81 7	19 5	23.9[20.5-27.7]	1.5	0.56 4	1.12[0.68-8-1.84]	0.878	0.96[0.53-1.71]	0.580	1.13[0.73-1.74]
<i>Head of household F</i>	17 4	44	25.3[18.3-33.9]	1.4	0.42 3	0.59[0.16-2.15]	0.367	1.80[0.50-6.48]	0.843	0.90[0.31-2.60]
Additional coping strategies, not reflected in rCSI										
Collected wild plants/ foods to eat- 3 to 7 days	81 7	31	3.8[2.3-6.1]	2.0	0.14 6	1.98[0.79-4.98]	0.137	2.12[0.79-5.68]	0.035	2.38[1.06-5.31]
<i>Head of household F</i>	17 4	14	8.1[3.5-17.7]	2.6	0.03 1	4.11[1.14-14.84]	0.002	8.69[2.17-34.70]	0.000	9.53[2.94-30.87]
Sent women and/ or children and other members to work for food	81 7	14 7	18.0[15.1-21.3]	1.4	0.34 9	1.29[0.76-2.19]	0.158	0.58[0.27-1.24]	0.990	1.00[0.61-1.64]
<i>Head of household F</i>	17 4	22	12.6[8.0-19.4]	1.2	0.21 5	2.16[0.64-7.28]	0.024	4.57[1.22-17.16]	0.036	3.14[1.08-9.17]
Eaten stored food	81 7	37	4.5[2.8-7.3]	2.4	0.13 5	1.92[0.82-4.51]	0.084	2.23[0.90-5.56]	0.286	1.55[0.69-3.49]
<i>Head of household F</i>	17 4	7	4.0[1.2-12.2]	2.4	0.73 7	1.45[0.16-12.78]	0.397	2.60[0.28-23.74]	0.904	1.14[0.13-9.97]
Purchased low quality food in the market	81 7	26 2	32.1[28.5-35.9]	1.3	0.02 4	1.65[1.07-2.56]	0.126	1.48[0.90-2.46]	0.012	1.64[1.12-2.42]
<i>Head of household F</i>	17 4	42	24.1[18.2-31.3]	1.0	0.08 2	0.16[0.02-1.26]	0.811	1.18[0.30-4.68]	0.469	0.65[0.21-2.06]
Bought on credit	81 7	34	4.2[2.6-6.5]	1.9	0.50 8	1.39[0.52-3.69]	0.960	1.03[0.31-3.46]	0.706	1.19[0.48-2.94]
<i>Head of household F</i>	17 4	8	4.6[1.9-11.0]	1.7	0.84 8	1.24[0.14-10.65]	0.477	2.21[0.25-19.80]	0.980	0.97[0.11-8.31]
MAHFP: Year-round	81 7	34 5	42.2[38.3-46.3]	1.4	0.02 8	1.62[1.05-2.50]	0.001	2.27[1.37-3.76]	0.002	1.82[1.24-2.66]
<i>In households that have been in the area > 1 year</i>	41 9	18 2	43.4[37.9-49.1]	1.4	0.04 4	1.90[1.02-3.56]	0.080	1.72[0.94-3.17]	0.013	1.92[1.15-3.21]
Use of improved water point	81 7	81 4	99.6[98.5-99.9]	1.5	0.27 2	0.26[0.02-2.88]	Perfect collinearity		0.424	0.37[0.03-4.16]
Purchase of water	81 7	70 2	85.9[82.7-88.6]	1.5	0.99 2	1.00[0.54-1.87]	0.829	1.08[0.52-2.25]	0.601	1.16[0.66-2.05]
Water distance < 500 meters/ 15 minutes	81 7	69 4	84.9[82.2-87.3]	1.1	0.01 6	2.84[1.21-6.65]	0.656	1.18[0.57-2.44]	0.048	1.88[1.00-3.53]
Water container same for transit & storage	81 7	66 3	81.2[77.3-84.5]	1.8	0.04 4	0.60[0.37-0.99]	0.117	1.83[0.86-3.92]	0.520	0.86[0.54-1.37]
No handwashing station	81 7	30 1	36.8[33.7-40.1]	0.9	0.89 7	0.97[0.62-1.52]	0.000	0.24[0.12-0.49]	0.028	0.63[0.41-0.95]
All five handwashing behaviors observed in HH's with a handwashing station	57 1	0	-	-			N/A			
Kitchen utensils left on the floor	81 7	50 6	61.9[57.9-65.8]	1.4	0.43 2	0.84[0.54-1.30]	0.278	1.34[0.79-2.27]	0.961	0.99[0.67-1.46]
Uncovered food	81 7	44 7	54.7[50.6-58.8]	1.4	0.55 6	1.14[0.74-1.76]	0.183	1.41[0.85-2.34]	0.379	1.19[0.81-1.74]
Visible kitchen waste	81 7	32 3	39.5[35.5-48.4]	1.6	0.27 1	0.78[0.49-1.22]	0.329	1.28[0.78-2.10]	0.473	0.87[0.59-1.28]

Children crawling in the dust/ soil	80 9	45 6	56.5[51.7-61.2]	1.9	0.40 8	1.21[0.77-1.88]	0.013	1.99[1.16-3.41]	0.052	1.48[1.00-2.19]
Animals inside of the home	81 7	39 2	48.0[43.5-52.5]	1.7	0.27 5	0.79[0.51-1.21]	0.300	0.77[0.47-1.27]	0.138	0.75[0.51-1.10]
Floor of house is soil	81 7	38 9	47.6[43.6-51.6]	1.4	0.56 3	0.88[0.57-1.36]	0.037	1.71[1.03-2.82]	0.598	1.11[0.76-1.61]
Very poor HH hygiene ¹²⁶	80 9	39 6	49.0[44.8-53.2]	1.5	0.47 6	0.85[0.55-1.32]	0.177	1.41[0.86-2.32]	0.815	0.96[0.65-1.40]
Latrine ownership	81 3	69 0	84.9[81.4-87.8]	1.6	0.26 0	1.37[0.79-2.38]	0.243	0.61[0.28-1.38]	0.244	1.33[0.82-2.18]

Table A 2: Statistical associations between risk factors and undernutrition- Linear regression IDP livelihood

Risk factor <i>Linear Regression- Kahda, IDP</i>					GAM [W/H] <i>Children 6-59 months</i>			GAM [MUAC] <i>Children 0-59 months</i>		
Indicator	n	Mean [95% CI]	Standard error	Design Effect	P- value	Coeff.	SE	P- value	Coeff.	SE
Child age [months]	817	30.1[29.1-31.2]	0.53	0.6	0.783	0.001	0.002	0.000	0.469	0.028
Mother's MUAC [cm]	689	290.4[287.3-293.5]	1.59	1.9	0.006	0.003	0.001	0.000	0.060	0.013
IDDS Score [scale, min 0- max 7]	313	1.7[1.6-1.9]	0.08	3.3	0.883	0.007	0.050	0.822	0.124	0.551
Women's external support scale [scale, min 1- max 4]	782	2.4[2.3-2.5]	0.04	1.2	0.847	-0.007	0.034	0.128	-0.693	0.455
<i>Head of household female</i>	158	2.1[1.-2.2]	0.08	1.3	0.663	0.034	0.078	0.074	1.900	1.057
rCSI [scale 0-56]	817	10.3[9.7-11.0]	0.34	1.3	0.030	-0.009	0.004	0.462	-0.037	0.051
<i>Head of household female</i>	174	10.7[9.1-12.2]	0.77	1.3	0.243	-0.010	0.008	0.004	0.300	0.102
MAHFP [scale 0-12]	817	10.4[10.2-10.5]	0.08	1.4	0.001	-0.059	0.017	0.000	0.814	0.223
<i>In households that have been in the area > 1 year</i>	419	10.5[10.4-10.7]	0.09	1.4	0.044	-0.0577	0.029	0.000	-1.427	0.393
Handwashing behaviors (scale 0-5), households with handwashing stations	516	1.3[1.3-1.4]	0.03	0.7	0.221	0.082	0.067	0.003	2.750	0.911
Household hygiene checklist [scale 1-6, increasing uncleanliness]	809	3.1[2.9-3.2]	0.07	1.3	0.376	0.016	0.019	0.168	-0.338	0.245

¹²⁶ A score of 1 point or more qualifies the household as having inadequate hygiene conditions. I've coded this as 3 and above for very poor.

B. SO 05, Goldogob district

Risk factor <i>Logistics regression-SO 05, Goldogob, Pastoral LZ</i>					Wasting : WHZ <-2 <i>Children 6-59 months</i>		Wasting: MUAC <125 mm <i>Children 6-59 months</i>		cGAM ¹²⁷ <i>Children 6-59 months</i>	
Indicator	N ¹²⁸	n	Prevalence [95% CI]	Design effect	P- value	Odds Ratio [95% CI]	P- value	Odds Ratio [95% CI]	P- value	Odds Ratio [95% CI]
Male child	579	288	49.7[46.5-53.0]	0.6	0.031	1.63[1.05-2.54]	0.981	1.01[0.41-2.47]	0.009	1.78[1.16-2.74]
Age group <24 months ¹²⁹	579	201	34.7[30.5-39.1]	1.2	0.454	1.19[0.76-1.87]	0.000	8.09[2.67-24.53]	0.111	1.42[0.92-2.19]
Age group <36 months ¹³⁰	579	351	60.6[56.4-64.7]	1.0	0.818	0.95[0.61-1.48]	0.013	12.99[1.73-97.73]	0.738	1.08[0.70-1.66]
Residence < 6 months	579	76	13.1[7.6-21.7]	5.9	0.036	1.84[1.04-3.27]	0.801	1.17[0.34-4.11]	0.023	1.91[1.09-3.32]
Residence < 1 year	579	97	16.8[10.4-25.8]	5.8	0.020	1.86[1.10-3.15]	0.831	0.87[0.25-3.04]	0.017	1.86[1.12-3.10]
Residence < 2 years	579	134	23.1[15.5-33.1]	6.2	0.073	1.56[0.96-2.54]	0.735	0.83[0.27-2.51]	0.049	1.60[1.00-2.57]
IDP	579	102	17.6[8.7-32.5]	13.5	0.804	1.07[0.61-1.87]	0.011	3.30[1.31-8.29]	0.359	1.28[0.76-2.17]
Refugee	579	3	0.5[0.1-2.3]	1.7	0.458	2.49[0.22-27.73]			0.513	2.23[0.20-24.86]
Head of household (F)	579	202	34.9[26.0-45.0]	5.7	0.606	1.13[0.72-1.77]	0.338	1.55[0.63-3.81]	0.488	1.17[0.75-1.81]
Household no main source of income	579	204	35.2[24.5-47.7]	8.5	0.248	0.76[0.47-1.21]	0.355	1.53[0.62-3.75]	0.484	0.85[0.54-1.33]
Household income: Waged labor/ petty trade	579	127	21.9[14.5-31.7]	6.1	0.153	0.66[0.37-1.17]	0.054	2.47[0.99-6.17]	0.388	0.79[0.46-1.35]
Household income: permanent job	579	14	2.4[0.8-7.5]	4.7	0.641	1.36[0.37-4.97]	0.456	2.21[0.27-17.78]	0.765	1.22[0.33-4.44]
Household income: Livestock	579	293	50.6[38.9-62.3]	8.0	0.986	1.00[0.65-1.55]	0.956	0.98[0.40-2.38]	0.907	1.03[0.67-1.56]
Household income: Agriculture	579	19	3.3[1.4-7.6]	3.5	0.266	1.81[0.64-5.15]	Perfect collinearity ¹³¹		0.367	1.62[0.57-4.59]
Measles vaccine : Confirmed by card ¹³²	524	89	17.0[9.4-28.8]	8.4	0.635	1.16[0.64-2.10]	0.786	0.81[0.18-3.69]	0.965	1.01[0.56-1.84]
Measles vaccine : Confirmed by card and/or Mother Recall ¹³³	524	188	35.9[25.3-48.0]	7.4	0.185	1.38[0.86-2.21]	0.990	0.99[0.33-3.01]	0.191	1.36[0.86-2.14]
BCG	579	173	29.9[21.6-39.7]	5.6	0.479	1.18[0.74-1.89]	0.139	1.97[0.80-4.84]	0.603	1.13[0.72-1.77]
Measles and BCG	524	65	12.4[6.5-22.4]	7.1	0.834	0.93[0.45-1.90]	0.829	1.18[0.26-5.41]	0.585	0.82[0.40-1.67]
Vitamin A supplementation, past 6 months, children < 1 year	78	14	18.0[9.3-31.8]	1.6	0.492	1.67[0.39-7.16]	0.391	1.91[0.44-8.35]	0.925	1.07[0.26-4.41]
Vit A supplementation, past 1 year, children 12-59 months	491	86	17.5[10.7-27.3]	5.6	0.850	0.94[0.50-1.76]	0.709	0.67[0.08-5.51]	0.686	0.88[0.47-1.64]

¹²⁷ Wasting by WHZ and/or MUAC and/or edema (n=0 for Golodgob)

¹²⁸ Children 6-59 months only.

¹²⁹ All ages estimated.

¹³⁰ All ages estimated.

¹³¹ Insufficient sample size to detect differences in malnourished and health children.

¹³² 9-59 months

¹³³ 9-59 months

Deworming	499	24	4.8[2.6-8.9]	2.4	0.292	1.67[0.64-4.34]	0.389	2.54[0.30-21.16]	0.367	1.55[0.60-4.03]
Diarrhea [2 previous weeks]	579	23	4.0[2.5-6.4]	1.3	0.082	2.26[0.90-5.64]	0.000	10.02[3.28-30.58]	0.012	3.03[1.27-7.20]
<i>If diarrhea- treated with ORS and/or Zinc</i>	19	12	63.2[33.0-85.6]	1.4	0.236	4.29[0.39-47.62]	0.376	3.00[0.26-34.20]	0.367	2.50[0.34-18.33]
Fever [2 previous weeks]	579	64	11.1[7.6-15.9]	2.4	0.932	1.03[0.52-2.05]	0.203	2.08[0.67-6.42]	0.671	1.15[0.60-2.20]
Fever AND Diarrhea	579	5	0.9[0.4-2.0]	0.9	0.848	1.24[0.14-11.21]	0.001	20.59[3.24-130.93]	0.232	3.00[0.50-18.18]
Cough [2 previous weeks]	579	71	12.3[8.6-17.3]	2.4	0.983	1.01[0.52-1.95]	0.087	2.50[0.88-7.07]	0.754	1.11[0.59-2.07]
Fever OR Diarrhea OR cough	579	121	20.9[16.1-26.6]	2.4	0.318	1.30[0.78-2.17]	0.002	4.04[1.64-9.94]	0.129	1.46[0.90-2.38]
Health seeking in a facility	134	32	23.9[14.4-36.8]	2.2	0.435	1.46[0.57-3.74]	0.783	1.22[0.30-4.88]	0.444	1.42[0.58-3.51]
Pharmacy	134	22	16.4[9.9-25.9]	1.5	0.409	0.58[0.16-2.12]	0.502	0.49[0.06-4.00]	0.256	0.47[0.13-1.72]
Traditional care and/or home remedy	134	4	3.0[0.9-9.4]	1.4	0.807	1.33[0.13-13.35]	Perfect collinearity		0.928	1.11[0.11-11.08]
No treatment sought	134	79	59.0[46.2-70.6]	2.1	0.688	0.84[0.36-1.97]	0.742	1.24[0.34-4.46]	0.908	0.95[0.42-2.15]
Child ever breastfed, 6-24 months	186	118	63.4[52.6-73.1]	2.1	0.937	0.97[0.45-2.08]	0.248	0.55[0.19-1.53]	0.814	0.92[0.45-1.87]
Continuation of breastfeeding at 1 year ¹³⁴	16	11	68.8[36.5-89.4]	1.2	0.550	0.40[0.02-8.07]	Perfect collinearity		0.931	0.89[0.06-12.88]
Acceptable IDDS score ¹³⁵	181	12	6.6[3.6-11.9]	1.1	Perfect collinearity					
IDDS Score Zero	181	33	18.2[12.2-26.3]	1.5	0.326	1.57[0.64-3.89]	0.537	0.62[0.13-2.86]	0.743	1.16[0.48-2.82]
Minimum Meal Frequency Adequate	117	73	62.4[47.3-75.4]	2.5	0.723	0.84[0.33-2.17]	0.452	1.88[0.36-9.75]	0.919	0.95[0.39-2.34]
Child clean	567	375	66.1[53.0-77.2]	9.3	0.239	1.34[0.82-2.17]	0.288	0.61[0.25-1.51]	0.358	1.24[0.78-1.97]
MUAC of mother <220 mm	465	25	5.4[3.3-8.7]	1.5	0.077	2.29[0.91-5.72]	0.027	4.48[1.19-16.88]	0.046	2.47[1.02-5.97]
MUAC of mother < 210 mm	465	5	1.1[0.4-2.9]	1.2	Perfect collinearity					
Mother of child currently pregnant or breast-feeding	485	249	51.3[42.2-60.4]	4.0	0.528	0.85[0.52-1.39]	0.401	1.51[0.58-3.97]	0.878	0.96[0.60-1.54]
Prenatal consultation- at least one consultation ¹³⁶	295	178	60.3[46.7-72.5]	5.2	0.528	1.24[0.64-2.39]	0.291	0.55[0.18-1.67]	0.974	0.99[0.53-1.84]
IFA during pregnancy	294	144	49.0[36.4-61.7]	4.8	0.509	1.24[0.66-2.34]	0.835	0.89[0.29-2.71]	0.853	1.06[0.58-1.95]
Mother has no source of income ¹³⁷	579	180	31.1[20.4-44.2]	9.6	0.676	1.10[0.69-1.76]	0.384	1.50[0.60-3.74]	0.654	1.11[0.71-1.74]
Maternal income: Livestock, agriculture, or fishing	577	304	52.7[40.2-64.8]	8.9	0.805	0.95[0.61-1.46]	0.807	0.89[0.37-2.18]	0.855	0.96[0.63-1.47]

¹³⁴ Children 12-15 months

¹³⁵ At least four food groups

¹³⁶ Only asked to mothers with children < 2 years old

¹³⁷ Asked to all children, regardless of if their mother was in the home.

Maternal income: Employee (salaried) or merchant/ trader	577	10	1.7[0.5-6.3]	4.2	0.567	0.55[0.07-4.35]	Perfect collinearity		0.499	0.49[0.06-3.90]
Maternal income: Casual labor, petty trade, and/or firewood	577	77	13.3[9.1-19.1]	3.0	0.757	0.90[0.47-1.74]	0.656	0.71[0.16-3.14]	0.717	0.89[0.47-1.68]
Mother perceived external support: Highest	533	337	63.2[50.8-74.2]	7.9	0.907	1.03[0.64-1.65]	0.702	0.83[0.31-2.21]	0.852	1.04[0.66-1.65]
Reduced coping strategies index: Medium or high	579	140	24.2[14.7-37.2]	9.9	0.889	0.96[0.58-1.61]	0.009	3.30[1.34-8.10]	0.944	1.02[0.62-1.66]
Consumption of Cheaper and Less Preferred Foods - 3 of 7 Days	579	83	14.3[8.2-23.9]	6.9	0.762	0.91[0.48-1.71]	0.050	2.68[1.00-7.19]	0.492	0.80[0.42-1.51]
<i>If head of household F</i>	202	46	22.8[11.7-39.7]	5.5	0.442	1.38[0.61-3.12]	0.445	1.74[0.42-7.26]	0.722	1.16[0.52-2.59]
Borrowing of food - 3 of 7 Days	579	73	12.6[6.8-22.3]	7.3	0.563	1.20[0.64-2.26]	0.004	4.02[1.55-10.44]	0.248	1.42[0.79-2.55]
<i>Head of household F</i>	202	41	20.3[10.9-34.6]	4.2	0.875	0.93[0.38-2.30]	0.015	5.45[1.39-21.32]	0.421	1.40[0.62-3.16]
Reducing the portion of meals - 3 by 7 days	579	109	18.8[11.4-29.4]	7.4	0.927	0.97[0.56-1.71]	0.475	1.46[0.52-4.10]	0.779	0.92[0.54-1.60]
<i>Head of household F</i>	202	57	28.2[16.7-43.5]	4.4	0.747	1.14[0.52-2.50]	0.684	0.72[0.14-3.56]	0.893	0.95[0.44-2.06]
Children-only meals - 3 to 7 days	579	80	13.8[8.3-22.1]	5.4	0.076	1.67[0.95-2.96]	0.001	4.51[1.78-11.41]	0.025	1.86[1.08-3.21]
<i>Head of household F</i>	202	44	21.8[13.2-33.8]	3.0	0.071	2.08[0.94-4.59]	0.004	8.16[1.95-34.11]	0.028	2.35[1.10-5.03]
Reducing number of meals in the day- 3 to 7 days	579	102	17.6[11.1-26.7]	5.8	0.804	1.07[0.61-1.89]	0.147	2.07[0.77-5.51]	0.941	1.02[0.59-1.77]
<i>Head of household F</i>	202	46	22.8[13.9-35.0]	3.1	0.917	0.95[0.40-2.27]	0.968	0.97[0.20-4.83]	0.628	0.81[0.34-1.90]
Additional coping strategies, not reflected in rCSI										
Collected wild plants/ foods to eat- 3 to 7 days	577	53	9.2[3.9-20.0]	9.6	0.266	0.61[0.25-1.46]	0.366	1.79[0.51-6.32]	0.170	0.54[0.23-1.30]
<i>Head of household F</i>	201	25	12.4[5.0-27.7]	5.2	0.415	0.59[0.17-2.09]	0.902	0.88[0.10-7.31]	0.298	0.51[0.15-1.81]
Sent women and/ or children and other members to work for food	577	89	15.4[8.5-26.3]	8.3	0.350	1.31[0.74-2.32]	0.075	2.45[0.91-6.55]	0.168	1.46[0.85-2.52]
<i>Head of household F</i>	201	42	20.9[10.5-37.3]	5.2	0.505	1.33[0.57-3.11]	0.017	5.24[1.34-20.46]	0.117	1.87[0.85-4.10]
Eaten stored food	577	65	11.3[5.6-21.3]	8.0	0.980	1.01[0.51-2.01]	0.011	3.62[1.34-9.77]	0.984	1.01[0.52-1.96]
<i>Head of household F</i>	201	25	12.4[5.2-26.8]	4.7	0.790	0.86[0.28-2.67]	0.069	3.86[0.90-16.56]	0.989	1.01[0.35-2.87]
Purchased low quality food in the market	577	110	19.1[11.6-29.7]	7.4	0.673	0.88[0.50-1.56]	0.005	3.69[1.49-9.15]	0.828	1.06[0.62-1.80]
<i>Head of household F</i>	201	66	32.8[19.1-50.3]	5.6	0.748	0.88[0.40-1.92]	0.041	4.40[1.06-18.19]	0.745	1.13[0.54-2.34]
Purchased food on credit	577	108	18.7[12.5-27.1]	4.9	0.810	1.07[0.62-1.86]	0.195	1.91[0.72-5.09]	0.965	1.01[0.59-1.73]
<i>Head of household F</i>	201	55	27.4[16.9-41.2]	3.7	0.951	1.03[0.46-2.30]	0.250	2.21[0.57-8.56]	0.983	1.01[0.46-2.19]
MAHFP: Year-round	579	452	78.1[68.6-85.3]	5.7	0.328	0.78[0.47-1.29]	0.832	1.13[0.37-3.44]	0.665	0.90[0.54-1.48]

<i>MAHFP: Year-round, in households that have been in the area for more than 1 year</i>	482	369	76.6[66.2-84.5]	5.5	0.799	0.93[0.52-1.66]	0.568	1.45[0.41-5.12]	0.819	1.07[0.60-1.87]
Use of improved water point	579	328	56.7[41.8-70.4]	12.5	0.074	0.67[0.43-1.04]	0.017	4.52[1.31-15.59]	0.188	0.75[0.49-1.15]
Purchase of water	579	214	37.0[24.5-51.4]	11.4	0.118	0.69[0.43-1.10]	0.224	1.74[0.71-4.25]	0.173	0.73[0.47-1.15]
Water distance < 500 meters or 15 minutes	579	553	95.5[88.2-98.4]	6.6	0.466	1.58[0.46-5.36]	0.241	0.40[0.09-1.84]	0.363	1.76[0.52-5.98]
Point of use water treatment: Unprotected water source	251	69	27.5[15.2-44.6]	6.3	0.437	1.31[0.67-2.56]	Perfect collinearity		0.566	1.22[0.62-2.37]
Water container same for transit & storage	579	315	54.4[42.7-65.7]	7.8	0.595	1.13[0.73-1.75]	0.337	1.58[0.62-4.02]	0.746	1.07[0.70-1.64]
No handwashing station	579	347	59.9[45.7-72.6]	11.1	0.290	1.28[0.81-2.02]	0.359	0.66[0.27-1.61]	0.475	1.17[0.76-1.81]
All five handwashing behaviors observed in HH's with a handwashing station	232	1	0.4[0-3.4]	1.0	Perfect collinearity					
Kitchen utensils left on the floor	579	181	31.3[20.8-44.0]	9.0	0.793	0.94[0.58-1.51]	0.394	1.49[0.60-3.70]	0.837	0.95[0.60-1.51]
Uncovered food	579	154	26.6[17.1-39.0]	8.8	0.370	0.79[0.47-1.32]	0.726	1.19[0.45-3.15]	0.476	0.84[0.51-1.37]
Visible kitchen waste	579	137	23.7[14.4-36.3]	9.5	0.545	1.17[0.71-1.93]	0.696	0.80[0.26-2.44]	0.761	1.08[0.66-1.76]
Children crawling in the dust/ soil	567	194	34.2[23.5-46.8]	8.6	0.348	0.79[0.49-1.28]	0.305	1.60[0.65-3.93]	0.358	0.80[0.51-1.28]
Animals inside of the home	579	195	33.7[22.4-47.2]	10.0	0.564	0.87[0.54-1.39]	0.899	1.06[0.42-2.71]	0.740	0.93[0.59-1.45]
Floor of house is soil	579	145	25.0[15.1-38.5]	10.5	0.599	0.87[0.52-1.46]	0.603	1.29[0.49-3.43]	0.572	0.87[0.53-1.43]
Very poor HH hygiene ¹³⁸	567	156	27.5[16.8-41.6]	11.0	0.681	0.90[0.54-1.49]	0.800	1.13[0.43-3.01]	0.793	0.94[0.58-1.52]
Latrine ownership	576	315	54.7[42.2-66.4]	8.8	0.509	1.16[0.75-1.80]	0.669	0.82[0.34-2.01]	0.513	1.15[0.75-1.76]

Table B 2: Statistical associations between risk factors and undernutrition- Linear regression-Pastoral Livelihood Golodgob

Risk factor <i>Linear Regression- Golodgob, Pastoral livelihood zone</i>					GAM [W/H] <i>Children 6-59 months</i>			GAM [MUAC] <i>Children 0-59 months</i>		
Indicator	n	Mean [95% CI]	Standard error	Design Effect	P-value	Coeff.	SE	P-value	Coeff.	SE
Child age [months]	579	30.4[29.3-31.6]	0.59	0.9	0.135	-0.005	0.003	0.000	0.405	0.029
Mother's MUAC [cm]	465	289.4[284.8-293.9]	2.29	3.9	0.158	0.002	0.001	0.755	0.003	0.011
IDDS Score [scale, min 0- max 7]	181	1.5[1.3-1.7]	0.09	1.6	0.635	0.035	0.074	0.100	1.044	0.631
Women's external support scale [scale, min 1- max 4]	533	1.6[1.5-1.6]	0.04	7.0	0.503	0.038	0.057	0.512	-0.375	0.572

¹³⁸ A score of 1 point or more qualifies the household as having inadequate hygiene conditions. I've coded this as 3 and above for very poor.

<i>In female headed households</i>	180	1.47[1.4-1.6]	0.06	4.0	0.384	- 0.096	0.110	0.918	0.110	1.071
rCSI [scale 0-56]	579	6.6[5.8-7.4]	0.39	10.6	0.354	- 0.005	0.005	0.272	0.056	0.051
<i>In female headed households</i>	202	9.3[7.8-10.7]	0.72	6.4	0.144	- 0.011	0.008	0.666	- 0.034	0.079
MAHFP [scale 0-12]	579	10.9[10.7- 11.1]	0.10	6.5	0.330	0.019	0.019	0.011	- 0.493	0.193
<i>In households that were residents > 1 year</i>	482	10.8[10.2- 11.4]	0.29	5.9	0.340	0.019	0.020	0.005	- 0.580	0.205
Handwashing behaviors (scale 0-5), households with handwashing stations	232	2.1[2.0-2.1]	0.04	3.8	0.239	0.138	0.117	0.079	2.251	1.28
Household hygiene checklist [scale 1-6, increasing uncleanliness]	567	1.8[1.1-2.4]	0.31	12.7	0.546	0.014	0.023	0.123	0.361	0.234

C. SO 15-16, Baidoa district

Risk factor <i>Logistics regression-SO 15-16, Baidoa, Agro-pastoral LZ</i>					Wasting : WHZ <-2 <i>Children 6-59 months</i>		Wasting: MUAC <125 mm <i>Children 6-59 months</i>		cGAM ¹³⁹ <i>Children 6-59 months</i>	
Indicator	N ¹⁴⁰	n	Prevalence [95% CI]	Design effect	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]
Male child	732	369	50.4[46.8-54.0]	0.9	0.137	1.45[0.89-2.38]	0.566	0.81[0.40-1.64]	0.428	1.20[0.77-1.87]
Age group <24 months ¹⁴¹	732	261	35.7[30.9-40.7]	1.9	0.042	1.67[1.02-2.73]	0.000	31.54[7.48-132.93]	0.000	2.47[1.58-3.88]
Age group <36 months ¹⁴²	732	451	61.6[57.3-65.7]	1.3	0.085	1.60[0.94-2.72]	0.003	21.31[2.89-156.83]	0.005	2.08[1.25-3.46]
Residence < 1 year	732	77	10.5[6.6-16.4]	1.5	0.207	1.59[0.77-3.27]	0.380	1.55[0.58-4.15]	0.363	1.38[0.69-2.74]
Residence < 2 years	732	137	18.7[12.3-27.4]	1.4	0.740	0.90[0.47-1.72]	0.409	1.41[0.62-3.20]	0.976	0.99[0.56-1.77]
Head of household (F)	732	133	18.2[10.9-28.7]	1.3	0.883	1.05[0.57-1.94]	0.025	2.36[1.11-5.00]	0.344	1.30[0.76-2.22]
Household no main source of income	732	155	21.2[11.2-36.3]	0.8	0.670	1.13[0.64-2.02]	0.385	1.42[0.65-3.12]	0.634	1.14[0.67-1.92]
Household income: Waged labor/ petty trade	732	105	26.6[23.8-29.7]	0.8	0.977	1.01[0.58-1.74]	0.469	0.73[0.31-1.71]	0.880	0.96[0.58-1.59]
Household income: permanent job	732	45	6.2[4.4-8.5]	1.3	0.441	0.62[0.19-2.07]	0.455	0.46[0.06-3.50]	0.237	0.49[0.15-1.61]
Household income: Livestock	732	92	12.6[9.8-16.1]	1.7	0.247	0.60[0.25-1.43]	0.133	1.94[0.82-4.61]	0.662	0.86[0.43-1.72]
Household income: Agriculture	732	265	36.2[32.8-39.7]	1.0	0.005	2.01[1.23-3.29]	0.734	0.88[0.42-1.84]	0.035	1.62[1.04-2.55]
Measles vaccine : Confirmed by card ¹⁴³	697	413	59.3[56.3-62.2]	0.6	0.556	1.17[0.69-2.00]	0.611	0.81[0.36-1.83]	0.963	1.01[0.62-1.65]
Measles vaccine : Confirmed by card and/or Mother Recall ¹⁴⁴	697	590	84.7[82.3-86.7]	0.7	0.755	1.13[0.54-2.35]	0.453	0.68[0.25-1.86]	0.929	0.97[0.50-1.87]
BCG	732	620	84.7[82.5-86.7]	0.6	0.951	1.02[0.52-2.01]	0.151	0.55[0.24-1.25]	0.712	0.89[0.49-1.62]
Measles and BCG	697	409	58.7[55.7-61.7]	0.7	0.491	1.21[0.71-2.06]	0.653	0.83[0.37-1.88]	0.875	1.04[0.64-1.69]
BCG	80	39	48.8[40.6-57.0]	0.5	0.615	0.75[0.25-2.29]	0.352	0.60[0.20-1.77]	0.161	0.49[0.18-1.3]
Vitamin A supplementation, past 1 year ... children 12-59 months	634	320	50.5[47.5-53.5]	0.6	0.908	0.97[0.56-1.68]	0.389	0.61[0.20-1.88]	0.611	0.87[0.52-1.48]
Deworming	648	424	65.4[62.4-68.4]	0.7	0.855	1.06[0.59-1.88]	0.807	0.88[0.32-2.45]	0.831	1.06[0.62-1.82]
Diarrhea [2 previous weeks]	732	11	1.5[0.8-2.7]	1.0	0.932	1.10[0.14-8.88]	0.002	8.63[2.18-34.16]	0.395	1.99[0.41-9.73]
<i>If diarrhea- treated with ORS and/or Zinc</i>	11	0	0	-						
Fever [2 previous weeks]	732	122	16.7[14.4-19.3]	0.8	0.792	1.09[0.58-2.06]	0.101	1.94[0.88-4.29]	0.379	1.29[0.73-2.25]
Fever AND Diarrhea	732	6	0.8[0.4-1.7]	1.0	0.608	1.76[0.20-15.28]	0.006	11.19[1.97-63.46]	0.152	3.50[0.63-19.39]
Cough [2 previous weeks]	732	103	14.1[11.8-16.7]	1.0	0.956	0.98[0.48-1.98]	0.491	1.38[0.55-3.42]	0.637	1.16[0.63-2.14]

¹³⁹ Wasting by WHZ and/or MUAC and/or edema (n=0 for Baidoa)

¹⁴⁰ Children 6-59 months only.

¹⁴¹ All ages estimated.

¹⁴² All ages estimated.

¹⁴³ 9-59 months

¹⁴⁴ 9-59 months

Fever OR Diarrhea OR cough	732	172	23.5[21.0-26.2]	0.7	0.809	0.93[0.52-1.67]	0.032	2.20[1.07-4.53]	0.554	1.17[0.70-1.94]
Health seeking in a facility	173	123	71.1[64.5-76.9]	0.8	0.447	1.66[0.45-6.13]	0.877	0.91[0.27-3.10]	0.277	1.88[0.60-5.87]
Pharmacy	173	38	22.0[17.4-27.3]	0.6	0.707	1.26[0.38-4.17]	0.429	1.65[0.48-5.68]	0.960	1.03[0.35-3.00]
Traditional care and/or home remedy	173	32	18.5[13.6-24.7]	0.9	0.167	2.24[0.71-7.00]	0.245	2.10[0.60-7.29]	0.111	2.24[0.83-6.07]
No treatment sought	173	16	9.3[6.0-13.9]	0.8	0.794	0.76[0.09-6.22]	Perfect collinearity		0.502	0.49[0.06-3.95]
Child ever breastfed, 0-24 months	227	211	93.0[89.3-95.4]	0.8	0.994	0.99[0.21-4.66]	0.989	0.99[0.21-4.60]	0.992	0.99[0.27-3.69]
Continuation of breastfeeding at 1 year ¹⁴⁵	31	28	90.3[69.6-97.4]	0.9	Perfect collinearity					
Acceptable IDDS score ¹⁴⁶	223	71	31.8[27.9-36.1]	0.5	0.479	0.72[0.29-1.79]	0.128	0.45[0.16-1.26]	0.038	0.40[0.17-0.95]
IDDS Score Zero	223	84	37.7[25.7-51.3]	0.6	0.384	1.43[0.64-3.18]	0.451	1.37[0.61-3.08]	0.152	1.65[0.83-3.30]
Minimum Meal Frequency Adequate	209	148	70.8[65.4-75.7]	0.7	0.781	1.14[0.45-2.88]	0.786	1.14[0.45-2.86]	0.582	1.25[0.56-2.77]
Child clean	732	409	55.6[53.2-58.5]	0.5	0.466	1.20[0.73-1.97]	0.571	1.23[0.60-2.51]	0.400	1.21[0.77-1.90]
MUAC of mother <220 mm	650	43	6.6[4.5-9.6]	1.7	0.963	1.03[0.35-2.98]	0.123	2.38[0.79-7.19]	0.978	1.01[0.38-2.67]
MUAC of mother < 210 mm	650	11	1.7[0.8-3.5]	1.6	Perfect collinearity					
Mother of child currently pregnant or breast-feeding	661	431	65.2[60.4-69.7]	1.6	0.876	1.04[0.60-1.82]	0.109	2.11[0.85-5.26]	0.416	1.24[0.74-2.07]
Prenatal consultation- at least one consultation ¹⁴⁷	369	254	68.8[64.0-73.3]	1.0	0.330	0.71[0.35-1.42]	0.388	0.67[0.26-1.68]	0.180	0.65[0.35-1.22]
IFA during pregnancy	376	243	64.6[59.6-69.4]	1.0	0.080	0.54[0.27-1.08]	0.348	0.65[0.26-1.61]	0.055	0.55[0.29-1.01]
Mother has no source of income ¹⁴⁸	732	269	36.8[33.2-40.4]	1.1	0.541	0.85[0.51-1.42]	0.673	0.85[0.41-1.79]	0.843	0.95[0.60-1.51]
Maternal income: Livestock, agriculture, or fishing	732	297	40.6[37.3-43.9]	15.1	0.278	1.31[0.80-2.14]	0.882	0.95[0.46-1.94]	0.728	1.08[0.69-1.70]
Maternal income: Employee (salaried) or merchant/ trader	732	45	6.2[4.2-8.9]	1.8	0.631	1.27[0.48-3.35]	0.470	0.48[0.06-3.57]	0.972	0.98[0.37-2.58]
Maternal income: Casual labor, petty trade, and/or firewood	732	117	16.0[13.0-19.4]	1.4	0.418	0.74[0.36-1.53]	0.406	1.44[0.61-3.40]	0.739	0.90[0.48-1.69]
Mother perceived external support: Lowest	710	125	17.6[15.5-19.9]	0.6	0.654	1.15[0.62-2.14]	0.581	1.27[0.54-3.00]	0.689	1.12[0.64-1.99]
Reduced coping strategies index: Medium or high	732	211	28.8[25.7-32.1]	0.9	0.272	0.73[0.41-1.29]	0.176	1.64[0.80-3.36]	0.805	0.94[0.57-1.54]
Consumption of Cheaper and Less Preferred Foods - 3 of 7 Days	732	178	24.3[21.5-27.3]	0.9	0.086	0.57[0.30-1.08]	0.417	1.37[0.64-2.94]	0.260	0.73[0.42-1.26]
Head of household F	133	55	41.4[35.7-47.3]	0.5	0.299	0.53[0.16-1.77]	0.359	1.79[0.52-6.18]	0.870	0.92[0.35-2.43]
Borrowing of food - 3 of 7 Days	732	104	14.2[11.9-16.9]	1.0	0.061	0.41[0.16-1.04]	0.033	2.38[1.07-5.28]	0.535	0.81[0.41-1.58]
Head of household F	133	40	30.0[23.1-38.2]	0.9	0.449	0.60[0.16-2.27]	0.620	1.29[0.47-3.52]	0.076	3.11[0.89-10.85]

¹⁴⁵ Children 12-15 months

¹⁴⁶ At least four food groups

¹⁴⁷ Only asked to mothers with children < 2 years old

¹⁴⁸ Asked to all children, regardless of if their mother was in the home.

Reducing the portion of meals - 3 by 7 days	732	131	17.9[15.1-21.0]	1.1	0.103	0.53[0.25-1.14]	0.063	2.07[0.96-4.47]	0.718	0.90[0.50-1.62]
<i>Head of household F</i>	133	32	24.1[17.0-32.9]	1.1	0.367	0.49[0.10-2.31]	0.632	0.75[0.23-2.43]	0.795	1.20[0.30-4.83]
Children-only meals - 3 to 7 days	732	147	20.1[17.0-23.5]	1.2	0.813	0.93[0.50-1.72]	0.006	2.74[1.33-5.64]	0.109	1.52[0.91-2.52]
<i>Head of household F</i>	133	30	22.6[14.8-32.9]	1.6	0.902	0.92[0.24-3.53]	0.261	2.11[0.57-7.76]	0.161	2.08[0.75-5.82]
Reducing number of meals in the day- 3 to 7 days	732	98	13.4[10.9-16.3]	1.2	0.170	0.55[0.23-1.30]	0.764	1.16[0.44-3.08]	0.475	0.78[0.39-1.56]
<i>Head of household F</i>	133	18	13.5[7.2-24.1]	1.9	0.464	0.46[0.06-3.72]	0.640	1.47[0.29-7.44]	0.847	1.14[0.30-4.37]
Additional coping strategies not reflected in rcCSI										
Collected wild plants/ foods to eat- 3 to 7 days	732	169	23.1[20.3-26.1]	0.9	0.554	0.83[0.46-1.52]	0.027	2.26[1.10-4.64]	0.602	1.15[0.69-1.91]
<i>Head of household F</i>	133	45	33.8[25.5-43.4]	1.2	0.191	2.11[0.69-6.43]	0.140	2.55[0.73-8.88]	0.037	2.80[1.06-7.39]
Sent women and/ or children and other members to work for food	732	49	6.7[4.9-9.1]	1.3	0.083	0.17[0.02-1.26]	0.211	2.00[0.67-5.94]	0.330	0.59[0.21-1.69]
<i>Head of household F</i>	133	17	12.8[7.5-20.9]	1.3	Perfect collinearity		0.578	1.59[0.31-8.05]	0.678	0.72[0.15-3.42]
Eaten stored food	732	239	32.7[30.1-35.4]	0.6	0.189	0.69[0.40-1.20]	0.226	1.55[0.76-3.15]	0.378	0.80[0.49-1.31]
<i>Head of household F</i>	133	58	43.6[34.9-52.7]	6.0	0.114	2.53[0.80-8.03]	0.448	1.62[0.47-5.58]	0.122	2.15[0.82-5.68]
Purchased low quality food in the market	732	217	29.6[26.9-32.5]	0.7	0.009	0.42[0.22-0.81]	0.105	1.80[0.88-3.65]	0.208	0.72[0.43-1.20]
<i>Head of household F</i>	133	57	42.9[37.0-49.0]	0.5	0.251	0.49[0.15-1.65]	0.417	1.67[0.48-5.77]	0.755	0.86[0.33-2.26]
Purchased food on credit	732	210	28.7[26.1-31.4]	0.6	0.171	0.67[0.37-1.19]	0.079	1.89[0.93-3.84]	0.805	0.94[0.57-1.54]
<i>Head of household F</i>	133	61	45.9[39.3-52.3]	0.6	0.764	1.19[0.39-3.59]	0.548	1.46[0.42-5.05]	0.394	1.52[0.58-3.94]
MAHFP: Year-round	732	267	36.5[32.9-40.2]	1.1	0.649	0.89[0.53-1.48]	0.068	0.45[0.19-1.06]	0.798	0.94[0.59-1.50]
<i>In households in the area for at least one year</i>	655	255	38.9[35.1-42.9]	1.1	0.902	0.97[0.56-1.66]	0.127	0.51[0.21-1.21]	0.952	1.01[0.63-1.65]
Use of improved water point	732	685	93.6[91.8-95.0]	0.8	0.913	1.06[0.37-3.07]	0.930	1.07[0.25-4.61]	0.924	1.05[0.40-2.75]
Purchase of water	732	442	60.4[56.9-63.8]	1.0	0.815	1.06[0.64-1.75]	0.691	1.16[0.56-2.39]	0.685	1.10[0.70-1.74]
Water distance < 500 meters or 15 minutes	732	634	86.6[83.6-89.1]	1.2	0.058	0.54[0.29-1.02]	0.472	1.56[0.47-5.20]	0.308	0.72[0.39-1.35]
Point of use water treatment, unimproved water point	47	25	53.2[37.0-68.7]	1.2	0.491	2.29[0.22-24.08]	Perfect collinearity		0.943	1.07[0.16-7.22]
Water container same for transit & storage	732	471	64.3[61.6-67.1]	0.6	0.334	0.78[0.48-1.29]	0.936	0.97[0.47-2.01]	0.285	0.78[0.50-1.23]
No handwashing station	732	167	22.8[21.3-24.4]	0.3	0.138	1.50[0.88-2.56]	0.143	0.45[0.16-1.31]	0.410	1.24[0.75-2.05]
All five handwashing behaviors observed in HH's with a handwashing station	565	20	3.5[2.1-5.9]	1.5	0.011	4.05[1.4-11.9]	0.328	2.13[0.47-9.64]	0.047	2.94[1.01-8.54]
Kitchen utensils left on the floor	732	415	56.7[53.3-60.0]	0.9	0.581	1.15[0.70-1.88]	0.638	1.19[0.58-2.42]	0.854	1.04[0.67-1.63]
Uncovered food	732	321	43.9[40.5-47.3]	0.9	0.523	1.17[0.72-1.91]	0.842	1.07[0.53-2.17]	0.590	1.13[0.72-1.77]
Visible kitchen waste	732	304	41.5[38.1-45.0]	0.9	0.995	1.00[0.61-1.64]	0.545	0.80[0.39-1.65]	0.664	0.90[0.57-1.43]
Children crawling in the dust/ soil	724	272	37.6[34.3-41.0]	0.9	0.422	1.23[0.74-2.02]	0.264	1.50[0.74-3.05]	0.495	1.17[0.74-1.85]

Animals inside of the home	732	269	36.8[33.6-40.0]	0.8	0.236	1.35[0.82-2.22]	0.439	0.74[0.35-1.58]	0.712	1.09[0.69-1.73]
Floor of house is soil	732	270	36.9[33.6-40.3]	1.0	0.157	1.43[0.87-2.34]	0.034	2.14[1.06-4.31]	0.129	1.42[0.90-2.23]
Very poor HH hygiene ¹⁴⁹	724	275	38.0[34.9-41.1]	0.8	0.587	1.15[0.70-1.90]	0.287	1.47[0.72-3.00]	0.655	1.11[0.70-1.76]
Latrine ownership	690	457	79.3[75.5-82.6]	1.4	0.221	0.72[0.42-1.22]	0.900	1.05[0.47-2.38]	0.420	0.81[0.50-1.34]

Table C. 2: Statistical associations between risk factors and undernutrition- Linear regression-Agropastoral livelihood Baidoa

Risk factor <i>Linear Regression- Baidoa, Agro-pastoral livelihood zone</i>					GAM [W/H] <i>Children 6-59 months</i>			GAM [MUAC] <i>Children 0-59 months</i>		
Indicator	n	Mean [95% CI]	Standard error	Design Effect	P- value	Coeff.	SE	P-value	Coeff.	SE
Child age [months]	732	31.3[30.2-32.4]	0.55	0.7	0.705	0.001	0.004	0.000	0.468	0.031
Mother's MUAC [cm]	650	280.1[276.7-283.5]	1.72	1.6	0.568	0.001	0.001	0.326	0.012	0.013
IDDS Score [scale, min 0- max 7]	223	2.5[2.2-2.9]	0.19	0.3	0.038	0.083	0.040	0.154	0.486	0.340
Women's external support scale [scale, min 1- max 4]	710	2.6[2.6-2.7]	0.04	0.6	0.558	0.028	0.049	0.546	0.295	0.488
<i>Head of household female</i>	130	2.7[2.5-2.9]	0.09	1.1	0.658	0.042	0.096	0.356	- 1.152	1.243
rCSI [scale 0-56]	732	10.6[9.9-11.3]	0.33	0.6	0.500	- 0.004	0.005	0.071	- 0.103	0.057
<i>Head of household female</i>	133	14.1[12.3-15.9]	0.90	0.8	0.638	- 0.004	0.009	0.092	- 0.197	0.012
MAHFP [scale 0-12]	732	11.1[11.1-11.2]	0.03	1.4	0.885	- 0.008	0.058	0.016	1.404	0.583
<i>In households in the area for at least one year</i>	655	11.1[11.1-11.2]	0.03	7.0	0.954	- 0.003	0.059	0.043	1.209	0.595
Handwashing behaviors (scale 0-5), households with handwashing stations	732	2.0[2.0-2.1]	0.03	0.6	0.005	0.147	0.052	0.681	- 0.215	0.523

¹⁴⁹ A score of 1 point or more qualifies the household as having inadequate hygiene conditions. I've coded this as 3 and above for very poor.

D. SO 13, Beltweyne district

Risk factor <i>Logistics regression-Beletweyne. Riverine</i>					Wasting : WHZ <-2 <i>Children 6-59 months</i>		Wasting: MUAC <125 mm <i>Children 6-59 months</i>		cGAM ¹⁵⁰ <i>Children 6-59 months</i>	
Indicator	N ¹⁵¹	n	Prevalence [95% CI]	Design effect	P- value	Odds Ratio [95% CI]	P- value	Odds Ratio [95% CI]	P- value	Odds Ratio [95% CI]
Male child	720	347	48.2[44.6-51.8]	0.9	0.268	1.34[0.80-2.24]	0.376	0.75[0.40-1.42]	0.775	1.07[0.69-1.65]
Age group <24 months ¹⁵²	720	231	32.1[28.0-36.4]	1.4	0.517	0.83[0.47-1.46]	0.000	7.42[3.57-15.43]	0.024	1.67[1.07-2.61]
Age group <36 months ¹⁵³	720	441	61.3[56.6-65.7]	1.5	0.034	0.57[0.34-0.96]	0.001	6.30[2.22-17.87]	0.888	0.97[0.62-1.51]
Residence < 6 months	720	7	1.0[0.3-3.6]	3.0	0.636	1.68[0.20-14.13]	0.345	2.80[0.33-23.86]	0.247	2.66[0.51-13.91]
Residence < 1 year	720	17	2.4[0.8-6.4]	4.4	0.047	3.21[1.01-10.15]	0.287	2.27[0.50-10.28]	0.011	3.76[1.35-10.41]
Residence < 2 years	720	61	8.5[4.3-16.1]	7.2	0.835	1.10[0.45-2.66]	0.382	1.55[0.58-4.09]	0.249	1.50[0.75-3.00]
Head of household (F)	720	262	36.4[25.0-49.5]	11.9	0.203	1.40[0.83-2.36]	0.331	0.71[0.36-1.42]	0.622	1.12[0.71-1.75]
Household no main source of income	720	139	19.3[13.1-27.6]	5.9	0.137	1.56[0.87-2.82]	0.972	1.01[0.46-2.25]	0.420	1.24[0.73-2.10]
Household income: Waged labor/ petty trade	720	263	36.5[26.6-47.8]	8.8	0.088	0.61[0.34-1.08]	0.182	1.54[0.82-2.90]	0.508	0.86[0.54-1.36]
Household income: permanent job	720	6	0.8[0.2-3.5]	3.1	Perfect collinearity ¹⁵⁴					
Household income: Livestock	720	145	20.1[12.3-31.2]	9.8	0.287	1.38[0.76-2.52]	0.274	1.49[0.73-3.05]	0.213	1.38[0.83-2.31]
Household income: Agriculture	720	263	36.5[26.8-47.5]	8.4	0.353	1.28[0.76-2.16]	0.051	0.47[0.22-1.00]	0.952	0.99[0.63-1.55]
Measles vaccine : Confirmed by card ¹⁵⁵	599	22	3.7[1.9-6.9]	2.3	Perfect collinearity					
Measles vaccine : Confirmed by card and/or Mother Recall ¹⁵⁶	599	197	32.9[21.9-46.2]	10.2	0.773	1.09[0.60-1.99]	0.292	1.46[0.72-2.96]	0.478	1.20[0.73-1.98]
BCG	720	202	28.1[18.8-39.7]	9.6	0.785	0.92[0.52-1.65]	0.859	1.06[0.53-2.13]	0.988	1.00[0.61-1.62]
Measles and BCG	599	20	3.3[1.8-6.0]	1.8	Perfect collinearity					
Vitamin A supplementation, past 6 months, children < 1 year	76	10	13.2[7.4-22.4]	0.9	Perfect collinearity		0.616	1.46[0.34-6.34]	0.967	0.97[0.23-4.16]
Vit A supplementation, past 1 year, children 12-59 months	636	94	14.8[9.6-22.0]	4.6	0.145	0.46[0.16-1.31]	0.001	4.68[1.91-11.43]	0.708	1.14[0.57-2.27]
Deworming	643	149	23.2[16.7-31.2]	4.6	0.991	1.00[0.51-1.97]	0.007	3.20[1.38-7.41]	0.243	1.39[0.80-2.43]
Diarrhea [2 previous weeks]	720	7	1.0[0.0-02.1]	1.1	Perfect collinearity		0.023	6.91[1.30-36.77]	0.803	1.32[0.15-11.38]

¹⁵⁰ Wasting by WHZ and/or MUAC and/or edema (n=0 for Beletweyne)

¹⁵¹ Children 6-59 months.

¹⁵² All ages estimated.

¹⁵³ All ages estimated.

¹⁵⁴ Insufficient sample size or variation to detect differences between malnourished and healthy children.

¹⁵⁵ 9-59 months

¹⁵⁶ 9-59 months

Fever [2 previous weeks]	720	48	6.7[4.2-10.4]	2.6	0.921	0.95[0.33-2.73]	0.001	3.87[1.68-8.93]	0.194	1.66[0.77-3.56]
Fever AND Diarrhea	720	1	0.1[0.0-1.0]	0.9	Perfect collinearity					
Cough [2 previous weeks]	720	23	3.2[1.8-5.5]	1.7	0.946	1.05[0.24-4.63]	0.000	6.68[2.48-17.98]	0.155	2.11[0.75-5.90]
Fever OR Diarrhea OR cough	720	68	9.4[6.0-14.7]	3.7	0.707	0.83[0.32-2.16]	0.000	6.00[2.97-12.12]	0.035	1.99[1.05-3.76]
Health seeking in a facility	69	7	10.1[5.2-18.8]	0.7	0.052	7.33[0.98-54.72]	0.569	1.67[0.288-9.66]	0.163	3.20[0.63-16.43]
Pharmacy	69	24	34.8[25.1-45.9]	0.8	0.823	1.24[0.19-8.00]	0.935	1.05[0.31-3.59]	0.511	1.50[0.45-5.02]
Traditional care and/or home remedy	69	5	7.3[2.6-18.9]	1.2	0.309	3.50[0.31-39.15]	0.987	0.98[0.10-9.53]	0.311	2.67[0.40-17.79]
No treatment sought	69	22	31.9[20.7-45.7]	1.2	Perfect collinearity		0.766	0.82[0.23-2.98]	0.069	0.14[0.02-1.17]
Child ever breastfed, 6-24 months	205	121	59.0[48.5-68.8]	2.2	0.215	0.52[0.19-1.46]	0.906	0.95[0.44-2.07]	0.802	0.91[0.44-1.88]
Continuation of breastfeeding at 1 year ¹⁵⁷	20	12	60.0[36.2-79.9]	1.0	Perfect collinearity		0.650	0.60[0.07-5.45]	0.650	0.60[0.07-5.45]
Acceptable IDDS score ¹⁵⁸	207	23	11.1[6.0-19.8]	2.3	Perfect collinearity		0.121	2.24[0.81-6.24]	0.360	1.60[0.58-4.37]
IDDS Score Zero	207	31	15.0[10.1-21.6]	1.3	0.276	1.95[0.59-6.44]	0.845	1.11[0.39-3.15]	0.207	1.79[0.72-4.24]
Minimum Meal Frequency Adequate	121	58	47.9[35.7-60.5]	1.9	0.732	0.76[0.16-3.58]	0.185	0.49[0.17-1.41]	0.267	0.58[0.22-1.52]
Child clean	716	326	45.5[34.4-57.1]	9.4	0.520	1.19[0.71-1.99]	0.165	1.57[0.83-2.96]	0.337	1.24[0.80-1.92]
MUAC of mother <220 mm	579	16	2.8[1.2-6.0]	2.5	0.231	2.20[0.61-7.96]	0.923	1.11[0.14-8.64]	0.567	1.45[0.40-5.22]
MUAC of mother < 210 mm	579	3	0.5[0-3.6]	2.8	0.210	4.69[0.42-52.52]	Perfect collinearity		0.353	3.14[0.28-35.01]
Mother of child currently pregnant or breast-feeding	636	307	48.3[39.3-57.4]	5.2	0.292	0.75[0.43-1.29]	0.123	1.70[0.87-3.31]	0.855	0.96[0.61-1.52]
Prenatal consultation- at least one consultation ¹⁵⁹	168	114	67.9[51.8-80.6]	3.9	0.590	1.39[0.42-4.58]	0.584	1.46[0.38-5.61]	0.905	1.06[0.40-2.78]
IFA during pregnancy	161	79	49.1[35.2-63.1]	3.1	0.683	1.27[0.41-3.96]	0.214	2.20[0.63-7.61]	0.529	1.35[0.53-3.47]
Mother has no source of income ¹⁶⁰	720	346	48.1[37.4-58.9]	8.4	0.439	0.82[0.49-1.37]	0.821	0.93[0.49-1.75]	0.827	0.95[0.62-1.47]
Maternal income: Livestock, agriculture, or fishing	720	164	22.8[14.8-33.3]	8.6	0.447	1.25[0.70-2.25]	0.525	1.26[0.62-2.57]	0.627	1.13[0.68-1.89]
Maternal income: Employee (salaried) or merchant/ trader	720	7	1.0[0.0-2.9]	2.1	Perfect collinearity					
Maternal income: Casual labor, petty trade, and/or firewood	720	201	27.9[18.5-39.8]	10.0	0.695	1.12[0.64-1.97]	0.605	0.82[0.40-1.71]	0.869	0.96[0.59-1.57]

¹⁵⁷ Children 12-15 months

¹⁵⁸ At least four food groups

¹⁵⁹ Only asked to mothers with children < 2 years old

¹⁶⁰ Asked to all children, regardless of if their mother was in the home.

Mother perceived external support: Highest	720	62	8.6[5.2-14.1]	4.2	0.569	0.74[0.26-2.11]	Perfect collinearity		0.158	0.47[0.17-1.34]
Reduced coping strategies index: Medium or high	720	123	17.1[9.7-28.4]	10.6	0.324	0.68[0.32-1.47]	0.000	3.42[1.77-6.62]	0.335	1.31[0.76-2.26]
Consumption of Cheaper and Less Preferred Foods - 3 of 7 Days	720	31	4.3[2.0-8.8]	4.3	0.637	0.70[0.16-3.03]	0.002	4.48[1.73-11.64]	0.102	2.08[0.87-4.99]
<i>If head of household F</i>	262	10	3.8[1.2-11.4]	3.1	0.359	2.12[0.43-10.50]	0.418	2.43[0.28-20.95]	0.155	2.77[0.68-11.23]
Borrowing of food - 3 of 7 Days	720	162	22.5[13.7-34.8]	11.3	0.654	1.15[0.63-2.08]	0.931	0.97[0.45-2.07]	0.627	1.13[0.68-1.89]
<i>Head of household F</i>	262	35	13.4[7.9-21.7]	2.5	0.920	1.06[0.34-3.26]	0.731	1.32[0.28-6.27]	0.967	1.02[0.37-2.83]
Reducing the portion of meals - 3 by 7 days	720	91	12.6[7.0-21.7]	8.1	0.053	0.31[0.10-1.02]	0.381	1.46[0.63-3.39]	0.335	0.70[0.34-1.45]
<i>Head of household F</i>	262	27	10.3[5.5-18.5]	2.6	0.976	1.02[0.29-3.63]	Perfect collinearity		0.642	0.74[0.21-2.61]
Children-only meals - 3 to 7 days	720	55	7.6[3.8-14.6]	6.6	0.168	0.36[0.09-1.53]	0.024	2.71[1.14-6.43]	0.721	1.15[0.53-2.53]
<i>Head of household F</i>	262	11	4.2[1.7-10.1]	2.2	0.438	1.87[0.38-9.13]	Perfect collinearity		0.689	1.38[0.29-6.66]
Reducing number of meals in the day- 3 to 7 days	720	82	11.4[6.3-19.7]	7.4	0.737	1.14[0.52-2.50]	0.098	1.98[0.88-4.45]	0.213	1.49[0.80-2.77]
<i>Head of household F</i>	262	32	12.2[6.4-22.1]	3.4	0.026	2.97[1.14-7.74]	0.632	1.47[0.31-7.02]	0.040	2.57[1.04-6.33]
Collected wild plants/ foods to eat- 3 to 7 days	720	33	4.6[2.3-8.9]	3.9	0.956	1.03[0.31-3.50]	0.114	2.42[0.81-7.25]	0.349	1.55[0.62-3.87]
<i>Head of household F</i>	262	15	5.7[2.6-12.2]	2.3	0.257	2.16[0.57-8.18]	0.693	1.53[0.18-12.73]	0.499	1.58[0.422-5.88]
Sent women and/or children and other members to work for food	720	26	3.6[2.0-6.6]	2.5	0.382	0.41[0.05-3.06]	0.656	1.40[0.32-6.14]	0.854	0.89[0.26-3.04]
<i>Head of household F</i>	262	13	5.0[2.2-10.7]	2.0	0.768	0.73[0.09-5.88]	0.587	1.80[0.21-15.14]	0.791	1.24[0.26-5.88]
Eaten stored food	720	61	8.5[4.1-16.7]	8.1	0.123	0.32[0.08-1.36]	0.382	1.55[0.58-4.09]	0.422	0.71[0.30-1.70]
<i>Head of household F</i>	262	12	4.6[1.5-13.3]	3.7	0.519	1.68[0.35-8.07]	Perfect collinearity		0.791	1.24[0.26-5.88]
Purchased low quality food in the market	720	82	11.4[5.9-20.7]	9.0	0.334	0.63[0.24-1.61]	0.002	3.14[1.51-6.54]	0.427	1.30[0.68-2.45]
<i>Head of household F</i>	262	19	7.3[3.8-13.5]	2.0	0.952	0.95[0.21-4.37]	0.216	2.74[0.56-13.52]	0.822	1.16[0.32-4.20]
Purchased food on credit	720	207	28.8[19.7-40.0]	9.0	0.650	0.87[0.49-1.56]	0.780	0.90[0.44-1.84]	0.464	0.83[0.51-1.36]
<i>Head of household F</i>	262	53	20.2[12.9-30.3]	2.9	0.732	0.84[0.30-2.32]	0.754	0.78[0.17-3.67]	0.559	0.76[0.30-1.93]
MAHFP: Year-round	720	251	34.9[25.6-45.5]	7.8	0.696	1.11[0.65-1.89]	0.038	0.43[0.20-0.96]	0.674	0.91[0.57-1.44]
<i>MAHFP: Year-round, in households that have been in the area for more than 1 year</i>	703	238	33.9[24.5-44.6]	7.9	0.681	1.12[0.65-1.95]	0.016	0.34[0.14-0.82]	0.498	0.85[0.52-1.37]
Use of improved water point	720	305	42.4[29.6-56.2]	13.4	0.764	0.92[0.55-1.56]	0.275	0.69[0.36-1.34]	0.585	0.88[0.57-1.38]

Purchase of water	720	90	12.5[6.2-23.7]	11.5	0.239	1.51[0.76-3.03]	0.146	0.34[0.08-1.45]	0.904	1.04[0.54-2.00]
Water distance < 500 meters, or 15 minutes	720	650	90.3[80.0-95.6]	11.0	0.720	0.86[0.38-1.97]	0.583	0.76[0.29-2.01]	0.705	0.87[0.43-1.77]
Point of use water treatment: Unprotected water source	415	155	37.4[26.3-50.0]	6.1	0.769	1.11[0.56-2.20]	0.707	1.16[0.53-2.58]	0.739	1.10[0.62-1.97]
Water container same for transit & storage	720	232	32.2[20.7-46.4]	13.7	0.641	0.87[0.50-1.53]	0.272	0.66[0.31-1.38]	0.471	0.84[0.52-1.35]
Observe for Ease of washing container	715	286	40.0[28.6-52.6]	10.9	0.308	0.76[0.44-1.30]	0.187	0.63[0.31-1.25]	0.211	0.75[0.47-1.18]
No handwashing station	720	141	19.6[10.9-32.6]	13.1	0.065	0.47[0.21-1.05]	0.677	0.84[0.36-1.93]	0.127	0.62[0.33-1.15]
All five handwashing behaviors observed in HH's with a handwashing station	579	0	-	-						N/A
Kitchen utensils left on the floor	720	127	17.6[10.7-27.7]	8.6	0.595	0.83[0.41-1.67]	0.043	0.23[0.05-0.95]	0.168	0.64[0.34-1.21]
Uncovered food	720	145	20.1[13.4-29.1]	6.7	0.315	0.70[0.35-1.41]	0.046	0.30[0.09-0.98]	0.055	0.54[0.28-1.01]
Visible kitchen waste	720	158	21.9[15.0-30.9]	6.5	0.290	0.69[0.35-1.36]	0.062	0.37[0.13-1.05]	0.118	0.63[0.35-1.13]
Children crawling in the dust/ soil	718	148	20.6[13.9-29.5]	6.5	0.915	0.97[0.51-1.83]	0.565	0.78[0.34-1.80]	0.707	0.90[0.52-1.56]
Animals inside of the home	720	184	25.6[17.0-36.6]	9.0	0.050	0.50[0.25-1.00]	0.024	0.30[0.11-0.85]	0.003	0.38[0.20-0.72]
Floor of house is soil	720	221	30.7[20.6-43.0]	10.6	0.771	0.92[0.52-1.61]	0.012	0.30[0.12-0.77]	0.222	0.73[0.45-1.20]
Very poor HH hygiene ¹⁶¹	718	152	21.2[13.2-32.3]	9.6	0.551	0.82[0.43-1.58]	0.016	0.09[0.02-0.64]	0.056	0.55[0.30-1.02]
Latrine ownership	674	207	30.7[19.7-44.5]	12.2	0.167	0.64[0.34-1.21]	0.017	2.25[1.15-4.37]	0.915	1.03[0.63-1.69]

Table D. 2: Statistical associations between risk factors and undernutrition- Linear Regression-Riverine livelihood Beletweyne

Risk factor <i>Linear Regression- Beletweyne, Riverine livelihood zone</i>					GAM [W/H] <i>Children 6-59 months</i>			GAM [MUAC] <i>Children 0-59 months</i>		
Indicator	n	Mean [95% CI]	Standard error	Design Effect	P-value	Coeff.	SE	P-value	Coeff.	SE
Child age [months]	720	31.9[30.9-33.0]	0.55	1.6	0.000	-0.014	0.003	0.000	0.368	0.028
Mother's MUAC [cm]	579	288.6[285.9-291.3]	1.39	5.0	0.004	0.004	0.001	0.000	0.058	0.015
IDDS Score [scale, min 0- max 7]	207	1.8[1.6-2.0]	0.10	3.0	0.047	0.109	0.054	0.260	-0.631	0.559
Women's external support scale [scale, min 1- max 4]	635	2.1[2.0-2.1]	0.04	11.6	0.115	0.064	0.041	0.000	-1.765	0.452
<i>In female headed households</i>	239	1.3[1.2-1.4]	0.05	3.8	0.048	0.187	0.094	0.236	-1.353	1.138
rCSI [scale 0-56]	720	9.1[8.6-9.5]	0.24	12.8	0.130	0.010	0.006	0.010	-0.183	0.071

¹⁶¹ A score of 1 point or more qualifies the household as having inadequate hygiene conditions. I've coded this as 3 and above for very poor.

<i>In female headed households</i>	262	8.9[8.1-9.6]	0.37	8.1	0.864	- 0.002	0.011	0.404	- 0.111	0.133
MAHFP [scale 0-12]	720	10.2[10.1-10.4]	0.07	9.7	0.001	- 0.072	0.021	0.631	0.115	0.240
<i>In households that were residents > 1 year</i>	703	10.2[9.8-10.7]	0.23	9.9	0.000	- 0.080	0.021	0.405	0.203	0.243
Handwashing behaviors (scale 0-5), households with handwashing stations	579	1.9[1.8-2.0]	0.03	12.3	0.379	- 0.052	0.059	0.313	- 0.673	0.667
Household hygiene checklist [scale 1-6, increasing uncleanliness]	718	1.4[1.2-1.5]	0.24	11.59	0.055	0.041	0.021	0.318	0.245	0.245

Annex 3: calculations of statistical associations between hypothetical risk factors and anthropometric measurements of children in sampled households (FSNAU secondary data analysis)

A. Kahda district

Mogadishu IDP Settlements (incl. Kahda)							
		Wasting			Stunting		
Indicator	Prevalence (95% CI)	p-value	Odds Ratio	95% CI	p-value	Odds Ratio	95% CI
Gender							
Sex (female)	0.4924016 (0.4811759, 0.5036349)	4.07e-11	0.6593937	(0.5824919, 0.7459357)	<2e-16	0.4525964	(0.3940141, 0.5190121)
KeyDecisonMaker (female or both)	0.268348 (0.2580688, 0.2788809)	0.731	1.0274070	(0.8796736, 1.1969626)	0.199	0.8949577	(0.7539746, 1.0584224)
MainProvider (female or both)	0.3227946 (0.3119364, 0.3338461)	0.313	0.9270725	(0.7993536, 1.0730924)	0.564	0.9697017	(0.8722755, 1.0753409)
Morbidity							
Diarrhea	0.4781022 (0.4668733, 0.4893531)	1.26e-07	1.3911779	(1.2310183, 1.5727168)	0.00761	0.8360224	(0.7327772, 0.9533216)
Measles	0.0423551 (0.03799842, 0.04717929)	0.313	1.0467921	(0.9509644, 1.138523)	0.00533	1.1227139	(1.0303442, 1.2145931)
Pneumonia	0.1271873 (0.1198478, 0.1349038)	1.02e-08	1.6190410	(1.3705408, 1.9062479)	0.27	1.1133371	(0.9168476, 1.3435062)
Vaccinated	0.8223238 (0.8135364, 0.8307855)	0.384	0.9324359	(0.7978278, 1.0935441)	0.0495	0.8476075	(0.7200244, 1.0016320)
Food Intake							
IronRich24	0.3383152 (0.3186534, 0.3585451)	0.282	0.8676171	(0.6667361, 1.1189501)	0.397	1.1132229	(0.8654641, 1.4222272)
IronRich7	0.5353638 (0.5171776, 0.5534573)	0.211	0.8717542	(0.7028370, 1.0807728)	0.63	0.9482913	(0.7641233, 1.1767707)
VitARich24	0.6050761 (0.5871553,	0.59	0.9419867	(0.7584355, 1.1718179)	0.78	0.9693333	(0.7795520, 1.2074290)

Mogadishu IDP Settlements (incl. Kahda)							
		Wasting			Stunting		
Indicator	Prevalence (95% CI)	p-value	Odds Ratio	95% CI	p-value	Odds Ratio	95% CI
	0.6227216)						
VitARich7	0.6829103 (0.6657326 0.6996083)	0.473	0.921316 3	(0.7375775 1.1544252)	0.851	0.978601 3	0.7818139 1.2292282
HDSS	5.014 (6.00)	0.0192	0.014077	0.006009	0.555	-0.003155	0.005339
Mother's MUAC	25.44 (25.80)	0.123	0.013124	0.008512	0.00122	0.030318	0.009356
Food Security and Livelihoods							
rCSI	12.24 (11.00)	0.00049 7	-0.01039	0.00298	0.38	-0.002096	0.002387
Health Environment							
Length of Stay	(3)*	3.03e-06	0.06580	0.01408	0.01222 0	0.002143	0.861

B. Goldogob district

Mudug							
		Wasting			Stunting		
Indicator	Prevalence (95% CI)	p-value	Odds Ratio	95% CI	p-value	Odds Ratio	95% CI
Gender							
Sex (female)	0.4848085 (0.4668734, 0.5027823)	0.0023 6	0.731986 7	(0.598122, 0.8943942)	0.00015 9	0.5661127 4	(0.41964037 , 0.7580956)
KeyDecisonMaker (female or both)	0.1202728 (0.1050025, 0.1373826)	0.857	1.040661 1	(0.6611765, 1.5828676)	0.178	0.6183719 3	(0.2865144, 1.17804993)
MainProvider (female or both)	0.1048735 (0.09059234 0.12106156)	0.617	1.122017 1	(0.7000724, 1.7329103)	0.363	0.7224318 4	(0.33419138 , 1.37956993)
Morbidity							

Mudug							
		Wasting			Stunting		
Indicator	Prevalence (95% CI)	p-value	Odds Ratio	95% CI	p-value	Odds Ratio	95% CI
Diarrhea	0.1136063 (0.1026319, 0.1255742)	1.02e-05	1.8478435	1.3999668 2.417232	7.59e-05	2.0783828	1.43049963 2.95815780
Measles	0.02775025 (0.02232235 , 0.03440885)	0.481	1.2263225	0.6702600 2.1021160	0.122	0.32908807	0.05391882 1.05293984
Pneumonia	0.153897 (0.1413241, 0.1673581)	0.183	1.1969186	(0.9139481, 1.5517754)	0.0918	1.36349410	0.93947824 1.93549274
Vaccinated	0.9337955 (0.9239494, 0.9424659)	0.844	1.0424537	(0.6999326, 1.6086012)	0.0974	1.9164476	(0.9560240, 4.56035755)
Food Intake							
IronRich24	0.3235294 (0.3024440, 0.3453475)	0.185	0.8254093	(0.6188207, 1.0919330)	0.425	1.16646538	(0.79368519 , 1.69436254)
IronRich7	0.7487073 (0.7198872, 0.7755222)	0.0577	1.5146341	(0.99893509 , 2.3610310)	0.131	0.65653495	(0.38461698 , 1.1525571)
VitARich24	0.8026738 (0.7837471, 0.8203412)	0.177	0.8067435	(0.5938341, 1.109157)	0.956	0.98722909	(0.6372635, 1.5852847)
VitARich7	0.8562565 (0.8321857, 0.8774423)	0.429	0.8283582	(0.5266186, 1.3433990)	0.51	0.79630530	(0.41942256 , 1.6461793)
VitASup	0.7359365 (0.7197585, 0.7515091)	0.318	0.9007173	(0.7308124, 1.0983382)	0.52	0.90835241	(0.67422601 1.195875)
Food Security and Livelihoods							
Remittances	0.05511811 (0.0435053, 0.0694977)	0.848	0.9317950	(0.4243405, 1.8226622)	0.57	0.71025644	(0.17079112 , 1.97462615)
Health Environment							
Unprotected Water Sources	0.4293844 (0.4072232, 0.4518290)	0.0958	1.2423185	(0.9618326, 1.6034487)	0.00992	0.60753058	(0.41240427 , 0.8815108)

Mudug							
		Wasting			Stunting		
Indicator	Prevalence (95% CI)	p-value	Odds Ratio	95% CI	p-value	Odds Ratio	95% CI
Gender							
Sex (female)	0.4848085 (0.4668734, 0.5027823)	0.00236	0.7319867	(0.598122, 0.8943942)	0.000159	0.56611274	(0.41964037, 0.7580956)
KeyDecisonMaker (female or both)	0.1202728 (0.1050025, 0.1373826)	0.857	1.0406611	(0.6611765, 1.5828676)	0.178	0.61837193	(0.2865144, 1.17804993)
MainProvider (female or both)	0.1048735 (0.09059234, 0.12106156)	0.617	1.1220171	(0.7000724, 1.7329103)	0.363	0.72243184	(0.33419138, 1.37956993)
Morbidity							
Diarrhea	0.1136063 (0.1026319, 0.1255742)	1.02e-05	1.8478435	(1.3999668, 2.417232)	7.59e-05	2.0783828	(1.43049963, 2.95815780)
Measles	0.02775025 (0.02232235, 0.03440885)	0.481	1.2263225	(0.6702600, 2.1021160)	0.122	0.32908807	(0.05391882, 1.05293984)
Pneumonia	0.153897 (0.1413241, 0.1673581)	0.183	1.1969186	(0.9139481, 1.5517754)	0.0918	1.36349410	(0.93947824, 1.93549274)
Vaccinated	0.9337955 (0.9239494, 0.9424659)	0.844	1.0424537	(0.6999326, 1.6086012)	0.0974	1.9164476	(0.9560240, 4.56035755)
Food Intake							
IronRich24	0.3235294 (0.3024440, 0.3453475)	0.185	0.8254093	(0.6188207, 1.0919330)	0.425	1.16646538	(0.79368519, 1.69436254)
IronRich7	0.7487073 (0.7198872, 0.7755222)	0.0577	1.5146341	(0.99893509, 2.3610310)	0.131	0.65653495	(0.38461698, 1.1525571)
VitARich24	0.8026738 (0.7837471, 0.8203412)	0.177	0.8067435	(0.5938341, 1.109157)	0.956	0.98722909	(0.6372635, 1.5852847)
VitARich7	0.8562565 (0.8321857, 0.8803273)	0.429	0.8283582	(0.5266186, 1.3433990)	0.51	0.79630530	(0.41942256, 1.6461793)

Mudug							
		Wasting			Stunting		
Indicator	Prevalence (95% CI)	p-value	Odds Ratio	95% CI	p-value	Odds Ratio	95% CI
	0.8774423)						
VitASup	0.7359365 (0.7197585, 0.7515091)	0.318	0.9007173	(0.7308124, 1.0983382)	0.52	0.90835241	(0.67422601, 1.195875)
Food Security and Livelihoods							
Remittances	0.05511811 (0.0435053, 0.0694977)	0.848	0.9317950	(0.4243405, 1.8226622)	0.57	0.71025644	(0.17079112, 1.97462615)
Health Environment							
Unprotected Water Sources	0.4293844 (0.4072232, 0.4518290)	0.0958	1.2423185	(0.9618326, 1.6034487)	0.00992	0.60753058	(0.41240427, 0.8815108)
Demographics							
TotalHH	5.288 (5.0)	0.00318	-0.024200	0.008198	0.0618	0.013507	0.007228
Food Intake							
HDDS	6.903 (7.0)	0.163	0.02548	0.01824	0.118193	-0.02581	0.01651
Food Security and Livelihoods							
rCSI	5.188 (5.0)	0.97	0.0002898	0.0076016	0.711	0.002459	0.006638

C. Baidoa district

Bay							
		Wasting			Stunting		
Indicator	Prevalence (95% CI)	p-value	Odds Ratio	95% CI	p-value	Odds Ratio	95% CI
Gender							
Sex (female)	0.4932021 (0.4819933, 0.5044177)	0.000234	0.7992420	(0.7091616, 0.9004498)	<2e-16	0.5898690	(0.5295480, 0.6567288)
KeyDecisonMaker	0.110201	0.715	1.0818124	(0.6994891,	0.812	0.9563421	(0.6577430,

Bay							
		Wasting			Stunting		
Indicator	Prevalence (95% CI)	p-value	Odds Ratio	95% CI	p-value	Odds Ratio	95% CI
(female or both)	(0.09420577, 0.12846913)			1.6294144)			1.3727765)
Main Provider (female or both)	0.06642066 (0.05401571, 0.08134493)	0.405	1.2412864	(0.7303373, 2.0286566)	0.975	0.9926271	(0.6200849, 1.5549900)
Morbidity							
Diarrhea*	0.09496175 (0.0885027, 0.1018351)	<2e-16	3.5846295	(3.0379906, 4.2240038)	6.26e-08	1.5893185	(1.3418680, 1.8773110)
Measles*	0.01417681 (0.01167513, 0.01718983)	1.87e-05	2.445167	(1.6067241, 3.6539516)	0.401	1.2051130	(0.7672674, 1.8386939)
Pneumonia*	0.04875793 (0.04406772, 0.05391223)	<2e-16	3.2074058	(2.5695815, 3.9904570)	0.237	1.1561990	(0.9048644, 1.4648531)
Vaccinated*	0.220313 (0.2103422, 0.2306157)	7.09e-06	1.3980716	(1.2066525, 1.6167655)	<2e-16	1.9304036	(1.6971677, 2.1942189)
Food Intake							
IronRich24	0.133509 (0.1199446, 0.1483273)	0.167	1.251071	(0.9038048, 1.7074199)	0.00623	1.4633861	(1.110111, 1.9169195)
IronRich7	0.2709706 (0.2528973, 0.2898246)	0.000231	1.5765638	(1.2350598, 2.0057969)	7.79e-06	1.624977	(1.3122190, 2.0088987)
VitARich24	0.6912604 (0.6717535, 0.7101156)	0.386	0.8980039	(0.7056707, 1.1476693)	0.0923	0.8346128	(0.6768827, 1.031335)
VitARich7	0.8019324 (0.7848339, 0.8180001)	0.313	0.8679810	(0.6620156, 1.1481428)	5.88e-05	0.6216061	(0.4936174, 0.7852141)
VitASup	0.07266734 (0.06673959, 0.07907092)	0.036	1.1265211	(1.0021055, 1.256373)	0.418	1.0478161	(0.9291933, 1.1683916)
Food Security and Livelihoods							
ReceivedCashAid	0.6072106 (0.5882295,	0.724	1.0439848	(0.8230905, 1.328304)	0.573	0.9391652	(0.7554717, 1.1697364)

Bay							
		Wasting			Stunting		
Indicator	Prevalence (95% CI)	p-value	Odds Ratio	95% CI	p-value	Odds Ratio	95% CI
	0.6258764)						
ReceivedFoodAid	0.5005693 (0.4813019, 0.5198349)	0.265	0.8757198	(0.6929239, 1.1058589)	0.396	0.9111721	(0.7347821, 1.1294183)
Remittances	0.06381323 (0.05135590, 0.07894595)	0.242	0.6211675	(0.2552716, 1.2906635)	0.363	0.7046835	(0.3067684, 1.4148811)

D. Hiraan (Beletweyne)

Hiraan / Belet Weyne							
		Wasting			Stunting		
Indicator	Prevalence (95% CI)	p-value	Odds Ratio	95% CI	p-value	Odds Ratio	95% CI
Gender							
Sex (female)	0.482971 (0.4641841, 0.5018057)	0.0874	0.8348467	(0.6782884, 1.0263942)	0.00225	0.7455588	(0.6171377, 0.8996654)
KeyDecisonMaker (female or both)	0.2695652 (0.2413707, 0.2997123)	0.149	0.7028364	(0.4268777, 1.1181626)	0.000181	2.006083	(1.3895463, 2.8828554)
MainProvider (female or both)	0.2228202 (0.1967198, 0.2512493)	0.0105	0.4654731	(0.2489242, 0.8099349)	0.0178	1.6046512	(1.0782501, 2.3615773)
Morbidity							
Diarrhea	0.1412626 (0.1288255, 0.1546730)	0.00714	1.4462742	(1.0999195, 1.8842563)	0.134	1.2141410	(0.9379989, 1.5591666)
Measles	0.004534356 (0.002523481, 0.007961931)	0.0316	3.4227599	(1.0300387, 10.3089652)	0.0261	3.4631717	(1.1108577, 10.4659153)

Pneumonia	0.1249128 (0.1131413, 0.1377029)	0.59	1.086086 4	(0.7979487, 1.4566739)	0.723	1.050994	(0.7938917, 1.3763253)
Vaccinated	0.5406348 (0.5221762, 0.5589837)	0.82	1.024354 1	(0.832663, 1.2618481)	0.139	0.867995 5	(0.7198014, 1.0471568)
Food Intake							
IronRich24	0.2502334 (0.2247668, 0.2775174)	0.0164	1.611702 1	(1.0846099, 2.3694199)	0.0704	1.398748 9	(0.9671930, 2.0032343)
IronRich7	0.3772176 (0.3482188, 0.4071080)	0.016	1.564402 6	(1.0853601, 2.2514340)	0.00887	1.559416 5	(1.1168450, 2.1746857)
VitARich24	0.8636788 (0.8413301, 0.8833691)	0.474	1.226242 7	(0.72010068 , 2.2167544)	0.39	1.249923 4	(0.7665697, 2.1326056)
VitARich7	0.8888889 (0.8681603, 0.9067691)	0.535	1.213857 1	(0.68027331 , 2.3370065)	0.108	1.645120 6	(0.92774434 , 3.1528740)
VitASup	0.3196092 (0.3026161, 0.3370902)	0.022	1.254117 3	(1.031543, 1.5253722)	0.611	1.048922 1	(0.8691062, 1.2573113)
Food Security and Livelihoods							
ReceivedCashAid	0.5632858 (0.5345621, 0.5915973)	0.205	1.255962 9	(0.8856681, 1.7941610)	0.31	0.847716 3	(0.6163165 1.1679635)
ReceivedFoodAid	0.6085499 (0.5801249, 0.6362675)	0.855	0.967603 4	(0.6813847, 1.3838986)	0.00727	0.644207 4	(0.4674494, 0.8891218)
Health Environment							
Unprotected Water	0.7009174 (0.6602362, 0.7387193)	0.258	0.731383 0	(0.4285970, 1.2730948)	0.179	1.477861 3	(0.85179941 , 2.6748913)
Demographics							
TotalHH	5.411 (5.0)	0.18038	-0.03997	0.02982	0.0616	0.02996	0.01602
Food Intake							
HDSS	6.508 (6.0)	0.9012	0.007512	0.060523	0.28701	-0.04332	0.04066

Mother's MUAC	25.55 (25.20)	0.00178	0.03757	0.01200	0.118	0.02332	0.01490
Food Security and Livelihoods							
rCSI	10.14 (7.0)	0.16768	-0.01602	0.01159	0.516	0.004696	0.007220

Annex 4: Qualitative Guide

Information note¹⁶²

Link Nutrition Causal Analysis (NCA) Somalia implemented by Action Against Hunger

Name of Principal Investigator: Nahashon Kipruto

INVITATION: We would like you to participate in a study conducted by Action Against Hunger, a non-governmental organization, which fights against the causes and effects of hunger in almost 50 countries around the world, including in Somalia. The organisation has expertise in the domain of health and nutrition, including mental health and care practices, water, sanitation and hygiene, as well as food security and livelihoods.

STUDY OBJETIVES: The main objective is to identify the major risk factors and causal pathways leading to acute malnutrition in Baidoa, Beltweyne, Goldogob and Kahda Districts. The findings will be used to develop recommendations that will used to make necessary adjustments in future programmes in order to utilise a more integrated approach in addressing the burden of malnutrition in the counties. The study will take place from [day 1, qualitative inquiry in the community] to [day 6, qualitative inquiry in the community].

PROCEDURE: In your community we would like to spend 6 consecutive days, starting today. We will share a detailed planning of our activities in order to facilitate the selection and mobilisation of participants for interviews and focus group discussions. The study will concern mainly parents of children under 5 years of age but other key informants may be solicited to contribute. Any person desiring to share his opinion outside of scheduled interviews and focus group discussions can approach the study team to do so. The study team would also like to conduct a number of observations and household visits in your community, if possible, in order for us to better understand your daily challenges. Focus groups discussions will be organised around themes, such as health, nutrition, care practices, water, hygiene and sanitation, food security and livelihoods, as well as gender. Each focus group discussion should be attended by 8-12 people, as outlined in the shared detailed planning. It should be noted that we will not be able to accommodate more people at the time. Participants are asked to come on time in order not to delay following focus group discussions. Do you agree to let us conduct this study in your community? Do you have any questions? If so, we will need you to appoint a community mobilizer, preferably the community health volunteer. It needs to be someone that is known and respected by all members of your community. The role of this person will be to mobilise participants for semi-structured interviews and focus group discussions, as outlined in our detailed planning. Preferably, the selection of participants will be coordinated with you. Please note that it is preferable if selected participants attend only one focus group discussion. If they wish to contribute more than once, this is

¹⁶² To be used as an opening of each exchange with key informants, be it a semi-structure interview or a focus group discussion. Sentences in grey are relative only for an initial meeting with community leaders.

permitted only if it concerns different topics. However, we are interested in talking to as many community members possible and for this reason it would be better if more people in the village/cluster of villages were mobilised to participate. Please note that the participation of a community mobiliser will not be remunerated and needs to be fully voluntary.

Please note that there is no good or bad response to our questions, no good or bad opinion, and no good or bad way of doing things. We are sincerely interested in immersing into your daily lives and learning about your beliefs and practices. If you agree to participate, we will ask for about one hour of your time.

CONFIDENTIALITY: We will not ask for your name and will not share the content of our discussion with other people in your community. Your name will not appear in our study and no one will be able to identify what you shared with us.

RISKS: Unfortunately, apart from our sincere appreciation, we cannot promise you anything in exchange for your participation in this study. The participation in this study does not guarantee your selection in future Action Against Hunger activities nor should it have a negative effect on your involvement in ongoing activities. However, during focus group discussions we will share some water and snacks with you, which you may choose to take home with you, if you wish.

INFORMED CONSENT: The participation in this study is your choice. You are free to stop the interview or leave the focus group discussion at any time. Your participation is fully voluntary. If you do not wish to answer a question, you may decline to do so and we will move onto a next question. If you have any questions about us or the work we do, you can ask us any time.

Seasonal Calendar¹⁶³

A Seasonal Calendar is a diagram of changes over the seasons – usually over the period of 12 months. Seasonal Calendars are useful to identify seasonal patterns of change – for example, changing availability of resources, such as food; to identify when people may be particularly vulnerable; to explore seasonal patterns of well-being and hardship and how different people are affected; or to identify when people are particularly vulnerable to infection.

During the qualitative survey, the study team will explore seasonal variations for each risk factor while the topic will be discussed. Respective risk factors will be listed on a printed template of a Seasonal Calendar, depicting twelve months of a universal year, aligned with the seasons of the year. During focus groups discussions, participants will be asked to define in what month each risk factor is most important and precise causes of these changes.

Historical Calendar

A Historical Calendar is a diagram that shows change over a certain period of time. A period of 10-15 years will be considered. However, if participants mention key events dating prior to these periods (including those that occurred in other countries), these will equally be noted. A Historical Calendar is useful for exploring change over time in a particular situation, and the reasons for change. This may include changes in behavior, knowledge and attitudes in a community. It is also useful when exploring the consequences of a particular event or assessing the effectiveness (impact) of a project or a community initiative.

During the qualitative survey, the study team will explore historical variations for each risk factor while the topic will be discussed. Respective risk factors will be listed on a hand-drawn template

¹⁶³ Participatory Learning and Action (PLA) tool no. 19 & 20 (<https://www.aidsalliance.org/>).

of a Historical Calendar (A2 format), depicting the timeframe in universal years. During focus groups discussions, participants will be asked to define in what year each risk factor was most important and precise causes of these changes. All important events that marked the life in a community in a positive or negative way, be it political, socio-economic, environmental or other, will be noted as potential triggers. The aim will be to draw trends based on the community knowledge and potentially identify correlations between various risk factors.

Storytelling¹⁶⁴

Storytelling involves participants discussing 'typical' stories from their community. This approach helps to open discussions on sensitive subjects in a non-threatening way and to identify the real-life situations and issues that affect people in their community. It helps to explore how people feel about those situations and what action they would like to take.

During the qualitative survey, the study team will introduce pre-prepared real-life stories during focus group discussions to test participants' standpoint on subjects, which may be particularly sensitive, and/or test their responses given in a classic question-answer exchanges. The aim of this method will be to shift the attention from them (which may make them feel uncomfortable) and rather involve as observers and counselors to other people in situations, which reflect their daily reality.

Daily Activities Chart

Daily activity charts show how people spend their time over the course of a day. They are useful to explore how men and women spend their day; to evaluate their workload and to discuss their different roles and responsibilities or to explore the factors that influence these differences.

During the qualitative survey, the study team will introduce printed images of daily activities in a given community and will ask participants of focus group discussions to place them on a timeline starting with the usual time when they get up and ending with the usual time when they go to bed. This will be done for men and women separately. Any other groups, such as children or elderly, or groups with different economic functions (farmers, herders or market sellers) may be introduced, if deemed relevant.

Meal Composition Chart

Meal composition charts show what people usually eat over the course of a day. They are useful to explore community's perception of good nutrition and how that reflects on their eating habits now and in situations when money would not be a barrier to a procurement of desired foods. For the purpose of this study two scenarios will be considered: typical food intake during lean season, typical food intake during rainy season, and a typical food intake when money would not be a barrier.

During the qualitative survey, the study team will introduce a hand-drawn chart (A2 format), divided into three columns, representing each scenario. The participants of a focus group discussion will be asked to state how many meals a day they eat during each scenario and what actual meals they eat at those times of a day.

Household Expenses

¹⁶⁴ Participatory Learning and Action (PLA) tool no. 58 (<https://www.aidsalliance.org/>).

Household expenses is a participatory exercise, the main objective of which is to show how household income is distributed to cover its expenses. It may reveal household's priorities in terms of spending, identify harmful behaviour or decision-making mechanisms within the household.

During the qualitative survey, the study team will introduce a printed set of images representing different types of regular expenses incurred by a household in a given community. These images will be placed in front of participants. The participants will also receive a set of pebbles representing money, which a household has available to cover these expenses. The role of participants will be to distribute the income among various expense group, just as they would in a real life.

Health Journey / Therapeutic Itinerary¹⁶⁵

This tool involves drawing the story of a person's health-seeking journey over a period of time. It involves tracing the development of person's health since falling ill, marking all different treatment options, which were explored in order to cure. The therapeutic itinerary is an engaging participatory exercise, which allows to open a discussion about traditional and non-traditional treatments in a non-threatening way. It also permits to explore people's understanding of current illnesses, which eventually trigger their choices. In addition, the tool allows to explore barriers of access to a biochemical treatment available in state-supported health facilities.

During the qualitative survey, the study team will introduce a blank sheet of paper (A2 format) and ask the participants to explain their typical health journey in case of current illnesses, which will be traced on a blank sheet of paper. The aim is to identify whether their knowledge of these illnesses triggers the same reaction and/or certain differences exist. A particular attention will be paid to an understanding and treatment of child undernutrition.

Gender Boxes¹⁶⁶

This tool involves participants placing 'typical' women and men in 'gender boxes' and identifying the roles, qualities and behaviours expected of them. It involves exploring what happens if a woman or man breaks out of their box and does not do what is expected of them. The aim of this exercise is to explore, in a non-threatening way, where those roles, qualities and behaviours come from and the pressures that they bring. It also allows to identify what roles, qualities and behaviours need to be changed and how that can be done. Gender boxes are particularly useful for exploring issues related to gender vulnerability, power and cultural traditions.

During the qualitative survey, the study team will introduce a blank sheet of paper (A2 format) and ask the participants to trace two same-size boxes next to each other. One will represent a woman and one will represent a man. The participants will then be asked to place all qualities, roles or behaviours expected of them inside the box. Any qualities, roles or behaviours not aligned with societal expectations will need to be drawn outside of the box. Once completed, the participants will be requested to compare and discuss what gender boxes show.

Agree/Disagree Game¹⁶⁷

This tool involves participants to express their agreement or disagreement with different statements relating to studied risk factors in their community. Agree/disagree game is highly interactive and engaging. It can serve as an energiser and an opener of more structured exchanges,

¹⁶⁵ Participatory Learning and Action (PLA) tool no. 17 (<https://www.aidsalliance.org/>).

¹⁶⁶ Participatory Learning and Action (PLA) tool no. 25 (<https://www.aidsalliance.org/>).

¹⁶⁷ Participatory Learning and Action (PLA) tool no. 36 (<https://www.aidsalliance.org/>).

which will follow. It helps to provide a lively and non-threatening way for people to explore their attitudes about key issues in their community. The agree/disagree game is particularly useful for exploring attitudes about gender, cultural traditions and stigma. It can also provide an additional layer of understanding to a researcher in a community, which is reliant on humanitarian assistance and whose answers to different questions may be biased by expectations of a follow-up aid.

During the qualitative survey, the study team will place three printed signs with emoticons in front of focus group participants. Each sign will represent 'I agree' 😊, 'I disagree' ☹️ or 'I am not sure'. The study team will then read out pre-prepared statements relating to a discussed topic and ask the participants to stand next to a sign, which represents their opinion on the matter. The participants will be encouraged to explain why they are standing by different signs. They will also be encouraged to try to persuade each other and change their minds if they wish to. Once all statements will be used, participants will be encouraged to discuss what the game has shown.

Courage to Change¹⁶⁸

This tool involves participants standing at different points along a line to show how easy or hard it is to adopt certain behaviours or make changes relating to challenges experienced in their communities. Using courage to change helps to create a non-threatening environment, in which participants can express freely how they feel about certain sensitisation messages deemed to improve their quality of life. The exercise allows participants to identify barriers, which they face in relation to suggested behaviours, which will eventually lead to a deeper understanding of a gap between knowledge and practice. This may be particularly helpful to organisations implementing projects focusing on behaviour change.

During the qualitative survey, the study team will draw a line on the ground. One end will represent "easy" while the other end will mean "difficult". The study team will then introduce pre-prepared behaviours, which are expected to be adopted by the community. The participants will be asked to position themselves at that end of the line that represents their attitude towards the stated behavior, i.e. whether it is easy or difficult to adopt. Participants will be encouraged to explain why they feel that way about those behaviours and what makes it easy/difficult to adopt.

Risk Game¹⁶⁹

This tool involves participants identifying a perceived risk relating to certain behaviours along a line showing a low to high risk. Using the risk game helps to explore people's knowledge and attitudes about levels of risk related to their current behavior and/or suggested behavior through sensitization activities. In this respect, the tool may help to identify areas of risky behavior that might need to be prioritized for future action. A risk game is particularly useful for raising awareness about illness prevention among the general community, including breastfeeding, care and hygiene practices.

During the qualitative survey, the study team will draw a line on the ground. One end will represent "low risk" while the other end will mean "high risk". The study team will then introduce pre-prepared behaviours, which are current in the community or expected to be adopted by the community. The participants will be asked to position a flashcard depicting the concerned behavior at that point of the line that represents their perception of risk related to the stated behavior, i.e. whether it is safe or dangerous practicing/not practicing certain behavior. Participants will be encouraged to explain why they feel that way about those behaviours.

¹⁶⁸ Participatory Learning and Action (PLA) tool no. 39 (<https://www.aidsalliance.org/>).

¹⁶⁹ Participatory Learning and Action (PLA) tool no. 55 (<https://www.aidsalliance.org/>).

Coping Strategies Exercise¹⁷⁰

This tool involves participants being asked to sequence coping mechanisms employed during difficult times. Adapted from the rCSI, different coping strategies are drawn on an A4 sheet: i.e. Reducing food portion size, reducing meal frequency, crediting money, begging food, reducing meal intake of adults to prioritize small children, eating less preferred foods (fufu instead of rice), prostitution, sending an adolescent girl for dowry payment, sending children to sleep in a different home, withdrawing children from school to save school fees. Participants are asked to select the first to last coping mechanisms to employ, as well as coping mechanisms that community members would never engage in.

Interview Guide: Health

1. How would you describe a healthy child? Are children on these images healthy? (Cf. [Child illness flashcards](#))
2. Are these illnesses present in your community? Which ones are the most widespread? (PROBE: [diarrhoea/cholera](#), [fever](#), [acute respiratory infections](#), [scabies](#), [malaria](#), [thrush](#))
3. Do they differ by season? (Cf. [Seasonal Calendar](#))
4. How have they changed over the past 10-15 years? (Cf. [Historical Calendar](#))
5. What do you think are the causes of these illnesses? (PROBE: [diarrhoea/cholera](#), [fever](#), [acute respiratory infections](#), [scabies](#), [malaria](#), [thrush](#))
6. How are these illnesses treated? (Cf. [Health journey/Therapeutic itinerary](#)) (NB: Trace for each cause independently. Inquire about seasonal differences)
7. Have the treatment options changed in the past 10-15 years? (Cf. [Historical Calendar](#))
8. How do you decide which treatment to choose? Who gives you advice?
9. What role do traditional health care providers (country doctors) play in your community? What about TTM's?
10. How do you care for a sick child? Do you do special things for them? (PROBE: [Do you breastfeed a sick child? Why/Why not? Do you feed him/her less/more? What types of food cannot be fed to a sick child? Why?](#))
11. Are some children in your community sicker than others? Do you know why? How would you describe them?
12. What do you do to keep your child healthy? How much effort does it take to do it every day?
13. Where is the nearest health post/health centre? How long does it take you to get there? Does your access change by season? (Cf. [Seasonal Calendar](#))
14. What are health post's opening hours? Is the staff available when there is an emergency? How do you contact them?
15. What kind of services are available in the nearest health post? Which ones do you use? Why?
16. Does the staff know how to treat illnesses, which are frequent in your community? Do they speak your dialect? Are they kind?
17. Who do you prefer to seek medical treatment from? Why?
18. What motivates you to seek treatment in the health post? What discourages you to do so? (PROBE: [quality of health care](#), [staff absence](#), [lack of drugs](#), [decision-making power](#), [workload](#), [distance to the health facility](#), etc.)

Recommendations

¹⁷⁰ Adapted from rCSI by Lenka Blanarova.

19. Have you tried to address these problems individually/collectively on a community level? If so, how?
20. Have there been any projects that attempt/attempted to address problems related to health/access to health facilities?
21. What do you think about them? Have you benefitted from them the way you wished? Why/Why not?
22. How do you think they could be improved? (SOLUTIONS)
23. Are there any obstacles to make it happen? (OBSTACLES)
24. What could be done on your side? (LOCAL CAPACITIES)
25. What do you need to make it happen? (NEEDS)
26. Which solution should have the greatest priority? What is the most important action to be taken? (PRIORITISATION)
27. Who should be targeted by this action in priority? Why?

Interview Guide: Malnutrition

1. What do you think of children on these photos? Are children on these images healthy? Why/Why not? (Cf. [Photos of wasted children \(Marasmus/Kwashiorkor\) + stunted children](#))
2. Is there any relationship between a child's height and his/ her health? If yes, what kind of relationship?
3. What factors determine a child's stature? (PROBE: [genetics, undernutrition, God's will](#))
4. How often is your child's height taken? Are you given feedback about your child's growth when you go to the clinic?
5. Which illness are they suffering from if a child is shorter than natural short stature? What words do you use to describe such children in your community? (PROBE: [all words for stunted children](#)) Are certain words more sensitive than others? Why? Are the same children who are (stunted) also too thin for their height (wasted/ marasmus)? How do you describe a child who is very thin for their height? What words do you use to describe them?
6. What are the causes of this illness? What are the reasons a child would become like this?
7. What do you think of this illness? (PROBE: [Is it similar to/different from other child illnesses? If so, how?](#))
8. Do you have children like this in your community? If yes, which type is most common?
9. Are there any households in your community, which are more affected by stunting? If yes, what do they have in common? (PROBE: [Are children of certain age group more affected? Why? Boys or girls? Why?](#))
10. Do you think your child can become like this? Why/Why not? (PROBE: [What behaviours/practices can induce/prevent this condition?](#))
11. Do you know any women in your community who are stunted? If so, why do you think they are like this?
12. Since when have children in your community been suffering from this illness? (Cf. [Historical Calendar](#))
13. How do you treat this illness in your community? (Cf. [Health journey/Therapeutic itinerary](#)) (PROBE: [What is the most common treatment? Why?](#))
14. What do you do to keep your child healthy?
15. What challenges do you face to keep your child healthy? During which seasons/months, does it become more difficult?
16. *Narration : XX has a large family with two little boys who are close in age. She was breastfeeding the first child for a few months but then she became pregnant again when he was only 5 months old. After that she stopped breastfeeding and started to give her first boy food that she prepared*

for the rest of the family. Her first son started to lose weight and become sick. He is not getting any better. She gave him Kpele leaf because the health clinic is 3 hours walk one way.

What do you think of this story? Did XX make good decisions? Why/why not? What would you do differently? What would you suggest XX does next?

Recommendations

17. Have there been any projects that attempt/attempted to address problems related to malnutrition?
18. What do you think about them? Have you benefitted from them the way you wished? Why/Why not?
19. How do you think they could be improved? (SOLUTIONS)
20. Are there any obstacles to make it happen? (OBSTACLES)
21. What could be done on your side? (LOCAL CAPACITIES)
22. What do you need to make it happen? (NEEDS)
23. Which solution should have the greatest priority? What is the most important action to be taken? (PRIORITISATION)
24. Who should be targeted by this action in priority? Why?

Interview Guide: Nutrition

1. What is a staple food in your community (what do you eat most?) How many times a day do you eat?
2. Have there been any changes to your eating habits in the past 10-15 years? (Cf. [Historical Calendar](#))
3. Are there any changes to your eating habits throughout the year? (Cf. [Seasonal Calendar](#))
4. What do you normally eat for a day during the dry season? (Note: Frequency & specific foods, breakfast, lunch, dinner) (Cf. [Meal composition](#))
5. What do you normally eat for a day during a post-harvest period? (Note: Frequency & specific foods, Cf. [Meal composition](#))
6. Would you like to eat differently (What would be your dream meal)? If yes, how? Why / why not? (Note: Frequency & specific foods, Cf. [Meal composition](#))
7. Who decides what you eat?
8. Are the eating habits of pregnant / lactating women the same? Why / why not?
9. Which foods can not be eaten by pregnant / lactating women? Why? Are certain foods taboo for all pregnant/ lactating women?
10. What foods can not be eaten by girls / boys? Why? Are certain foods taboo for all pregnant/ lactating women?
11. Which foods do you consider good for your health? Why?
12. Do you have access to these foods in your community? Where do you go? (PROBE: [Own production / purchase / food aid / other](#))
13. Does access change throughout the year? (Cf. [Seasonal Calendar](#))
14. Has access changed in the last 10-15 years? (Cf. [Historical Calendar](#))
15. Do you have enough food to feed your household all year round?
16. Has this changed in the last 10-15 years? (Cf. [Historical Calendar](#))
17. What do you think of two children's meals in the photo? (Cf. [images of balanced / unbalanced meals](#))
18. What do you think of two children's meals on the second picture? (Cf. [Images of food portions](#))
19. How would you divide this food in your family? Does the family eat together or in a specific order?

20. **Narration:** *XX has a husband and 5 children. Her husband's parents eat in their yard. One day the husband gave her small money to prepare an evening meal. XX bought rice but that will not be enough for the whole family. At dinner time, she reserved a plate for her husband and his parents. She gave the rest of the meal to her older children, two boys. XX and her three little girls eat the crust and go to bed unsatisfied.*

What do you think of this story? What do you think of XX's situation? Do women in your community face the same difficulties? Why / why not? What would you do differently?

Recommendations

21. Have there been any projects that attempt/attempted to address problems related to nutrition?
22. What do you think about them? Have you benefitted from them the way you wished? Why/Why not?
23. How do you think they could be improved? (SOLUTIONS)
24. Are there any obstacles to make it happen? (OBSTACLES)
25. What could be done on your side? (LOCAL CAPACITIES)
26. What do you need to make it happen? (NEEDS)
27. Which solution should have the greatest priority? What is the most important action to be taken? (PRIORITISATION)
28. Who should be targeted by this action in priority? Why?

Interview Guide: Breastfeeding & Complementary Feeding

1. How does your daily routine with a baby look like? (Cf. [IYCF & Care practices flashcards](#))
2. Does your routine change throughout the week? If so, how?
3. Does your routine change throughout the year? If so, how? (Cf. [Seasonal Calendar](#))
4. Has the daily routine changed in the past 2 / 10-15 years? Do you do things differently than your parents/grandparents? Explain. (Cf. [Historical Calendar](#))
5. Would you like the daily routine to change? If so, how? Why?
6. Does someone help you with child caring? If so, when (daily/weekly/sporadically)?
7. How are fathers involved in child caring activities? How do you feel about their involvement? (sufficient/not sufficient?) Why?
8. What challenges do you face when caring for your children? (PROBE: lack of knowledge/resources/time/other)
9. **Narration:** *XX is 23 years old. She has four children. The last one was born three months ago. She is breastfeeding when she is at home in the morning and evening. In the meantime, she has many activities (fetching water, collecting firewood, scratching the field) and she does not bring her baby with her. She leaves the baby with her mother. A few weeks ago, she went to the health center and the staff told her to breastfeed her baby on demand so that he could grow well. But she has so many things to do! She can not carry the child all day!*

What do you think of this story? What do you think of XX's situation? Do women in your community face the same difficulties? Why / why not? What would you do differently?

Agree/ Disagree (+ DEBRIEFING)

10. When my baby is born, the first thing I give him to drink is water.
11. When my baby is born, I wash him and put him to sleep.
12. When my baby is born, I immediately breastfeed.
13. When my baby is born, the first milk in my breasts is not good. I throw it.

14. When my baby is born, I take him to a religious leader for blessing.
15. When I breastfeed, I also give water to my baby because it is very hot and the baby is thirsty!
16. When I'm breastfeeding, I do not have enough milk to keep my baby happy.
17. Breastfeeding is time-consuming.
18. When I'm breastfeeding, I feel weak.
19. When I'm breastfeeding, my breasts hurt.
20. When I'm breastfeeding, I eat more.
21. When I'm breastfeeding, I can not eat all types of foods.
22. When I become pregnant, I stop breastfeeding because it is bad for the child receiving titty.
23. When I work, my milk is hot and I can not breastfeed my baby.
24. I start feeding my baby family foods at 4 months old.
25. I start feeding my baby family foods at 8 months old.
26. If I start feeding the baby too early, it will be less resistant later.
27. I do not prepare special meals for my baby; I feed my baby with the food I prepare for the whole family.
28. During meals, I help my baby to eat.
29. During meals, older children help my baby eat.
30. When my baby does not want to eat, I do not force him.
31. When my baby cries, I take him in my arms to calm him down.
32. When my baby cries, I feed him.
33. When my baby cries, I give him something to drink.
34. When my baby is crying, I let him calm himself.

Risk game (+DEBRIEFING)

35. Breastfeeding on demand.
36. Breastfeeding when a woman is pregnant.
37. Breastfeeding when a woman is hot or ill.
38. Eating little during breastfeeding.
39. Giving water to the baby before he is 6 months old.
40. Giving the baby food before the age of 6 months.
41. Give family meals to the baby.
42. Leave a baby with older siblings.
43. Leave a baby with his grandmother / grandfather.
44. Raise your voice or slap a baby while doing something wrong.

Courage to Change (+Debriefing)

45. Early initiation of breastfeeding.
46. Exclusive breastfeeding up to 6 months.
47. Breastfeeding on demand.
48. Prepare special meals for babies.
49. What do you normally give to your baby throughout the day when he is first starting to eat big people food? (Cf. [Composition of meals](#))
50. Would you like to give him something else? If yes, how? Why / why not? (Cf. [Composition of meals](#))
51. Have children's eating habits changed in the last 10-15 years? Do you do things differently from your parents / grandparents? Explain. (Cf. [Historical Calendar](#))
52. *Narration: XX has a little boy. He is very active. He likes to play. He likes to run. Sometimes he is really disobedient. While XX's husband migrates to find work, XX remains alone with her little boy.*

She is now pregnant with her second child. This morning, the little boy woke up very energetically. He sings and jumps. XX has just returned from the water point and put a canister next to the door. As the little boy ran around, he knocked over the can and the water flooded the yard. XX was really angry and slapped him.

What do you think of this story? What do you think of XX's situation? Do women in your community face the same difficulties? Why / why not? What would you do differently?

Recommendations

53. Have you tried to solve these problems individually / collectively at the community level? If yes, how ?
54. How do you think they could be solved? (SOLUTIONS)
55. Are there any obstacles to getting there? (OBSTACLES)
56. What could be done on your side? (LOCAL CAPACITIES)
57. What do you need to get there? (NEEDS)
58. Which solution should have the highest priority? What is the most important action to take? (PRIORITIZATION)
59. Who should be targeted by this action as a priority? Why ?

Interview Guide: Marriage, Birth Spacing, Pregnancy

1. At what age do young men get girlfriend and/or marry in your community? What is the usual age of women they are getting boyfriend and/or marrying? Do you consider it problematic? Why/Why not? What are the reasons for marrying at that age?
2. *Narration: XX is 14 years old. She has 7 other siblings and she is the oldest one. There are many mouths to feed in the female. Her parents think XX should marry because she is of the right age, and it would reduce the burden on the family, but XX would like to continue with school.*
What do you think of this story? What do you think about XX's situation? Do women in your community face same difficulties? Why/why not? If you were XX's parents, what would you do differently?
3. Are there other reasons for early marriage in your community?
4. When do you think a girl is ready to be a mother (physically and emotionally?)
5. Who advises women, especially adolescent girls, during pregnancy?
6. Do couples in your community have disagreements during the marriage? Are they frequent? How are they managed? What is the cause of these disagreements?
7. *Naration: XX is 20 years old; she has 2 children and is pregnant with her third. She met her boyfriend when she was 14 years old. At the time, she was in school; both of her parents were together and her pa supported her. XX's mother went and loved outside, so the father left, and the mother went to her new man, who did not support XX. XX was not getting any good support from the new pa so she starting loving with her boyfriend. She got pregnant and had to drop out of school. XX has a big dream to return to school, but her boyfriend is so jealous that he can't even allow XX to go to the market or sit with her friends. Even if she sits in a gathering like this (Link NCA FGD), the boyfriend will want to sit across and supervise.*
What do you think of this story? What do you think about XX's situation? Do women in your community face same difficulties? Why/why not? If you were XX parents, what would you do differently? What advice would you give to her?
8. How many children do people in your community usually have? Why?

9. What is the usual birth spacing in your community? How do you feel about this? (Short / adequate / long) Why?

Agree/ Disagree Game (+ DEBRIEFING)

10. When I'm pregnant, I go to a health center for a medical consultation.
11. When I am pregnant I go to a religious leader for a blessing.
12. When I am pregnant I can take country medicine when I get sick.
13. When I am pregnant, I visit the TTM.
14. When I'm pregnant, I do not go to a health center, it's too far.
15. When I'm pregnant, I do not go to a health center because staff are rarely there.
16. When I'm pregnant, I do not go to a health center because I do not have money.
17. When I'm pregnant, I do not go to a health center because I do not have time.
18. When I'm pregnant, I eat more so my baby can grow.
19. When I'm pregnant, I eat potter.
20. When I'm pregnant, I chew cola.
21. When I'm pregnant, I have certain foods that are taboo for me that are not taboo when I'm not pregnant.
22. When I'm pregnant, I eat less because I do not feel well.
23. When I'm pregnant, I eat less because I'm afraid my baby will grow up too fast.
24. When I'm pregnant, I pound the mother (beat cassava/ rice).
25. When I'm pregnant, I work less.
26. I prefer to give birth at home.
27. I prefer to give birth in a health center.
28. After birth, I resume my activities after a few days.
29. If I wanted to space births, I would be poorly perceived in my community.
30. If I wanted to use family planning, my husband must agree to me.
31. If I used family planning, I could not have children anymore.

Risk game (+Debriefing)

32. Young woman having a baby at 14 or 15 years old.
33. Woman having a baby at 40 years old.
34. Woman having a baby every twelve months.
35. Woman who gets pregnant while nursing her baby.
36. Woman not attending antenatal care at a health center.
37. Woman not following the food prohibitions during pregnancy.
38. Woman working during pregnancy.
39. Woman giving birth at home.
40. Woman working after childbirth.

Courage to change (+ DEBRIEFING)

34. Have a first child at 13 years old.
35. Have children about two years apart.
36. Have fewer children.
37. Use different methods of contraception.
38. Attend antenatal care at the health center.
40. Do not work during pregnancy.
41. Do not observe dietary restrictions during breastfeeding.

Recommendations

42. Have you tried to solve these problems individually / collectively at the community level? If yes, how?
43. How do you think they could be solved? (SOLUTIONS)
44. Are there any obstacles to getting there? (OBSTACLES)
45. What could be done on your side? (LOCAL CAPACITIES)
46. What do you need to get there? (NEEDS)
47. Which solution should have the highest priority? What is the most important action to take? (PRIORITIZATION)
48. Who should be targeted by this action as a priority? Why?

Interview Guide: Social Status & Women's Workload

1. What does your daily routine look like, by hour? (Cf. [daily activities](#))
2. Does your routine change during the year? If yes, how? (Cf. [Seasonal Calendar](#))
3. How do you perceive your workload? How do you feel ?
4. When do you feel the busiest or tired? What do you do when you feel like that? Do you have someone to help you ?
60. Has the daily routine changed in the last 10-15 years? Do you do things differently from your parents/ grandparents? Explain. (Cf. [Historical Calendar](#))
5. Are there differences in daily routines between different households? If so, what differences? What characterizes these households?
6. How does your daily routine differ from that of men?
7. Did you attend school when you were younger? What are the reasons why girls do not go to school in your community? What are the reasons they drop out of school ?
8. Can women in your community make their own decisions? If so, what can you decide for yourself? (PROBE: [schooling, marriage, household expenses, meal composition, daily activities, workload, postpartum rest, medical treatment in case of illness, family planning?](#))
(or alternatively for 8&9) Agree/disagree game (+DEBRIEFING)
1. I could decide if I go to school or not.
2. I can decide whether my children are going to school or not.
3. I decided when I wanted to get married.
4. My husband decides how I spend money.
5. I decide what I cook.
6. My husband tells me how much I can spend on food.
7. I only prepare dishes that my husband likes.
8. I can not decide on my job, I have to do everything that women are supposed to do.
9. My husband has less responsibility than me.
10. After birth, I can rest for 6 weeks.
11. When I'm sick, I can decide who to see to treat my illness.
12. When my children are sick, I have to ask my husband who to see to treat their illness.
13. I can tell my husband that I do not want more children.
14. I can decide on all household affairs when my husband is not at home.
15. If you have a problem, who will you see to help you? What was the most recent situation when you needed someone's help? Explain.
16. What makes you feel most tired in your relationships? (PROBE: children, husband, friends)
17. What can cause confusion/ holla holla in your home? How do you sort your confusion?
18. What opportunities do women in your community have? (PROBE: [What roles can young women aspire to play in their community as adults?](#)) What do you think of these possibilities -

are they sufficient? If not, what is missing? What would you like to change / do differently?
What's stopping you from doing it?

19. Do you feel safe in your community? Has there been a change in community relations in the last 10-15 years? (Cf. [Historical Calendar](#))
20. What activities do you usually do with other members of the community? Are there any opportunities that you celebrate together? (Cf. [Seasonal Calendar](#))

Recommendations

21. Have you tried to solve these problems individually / collectively at the community level? If yes, how?
22. How do you think they could be solved? (SOLUTIONS)
23. Are there any obstacles to getting there? (OBSTACLES)
24. What could be done on your side? (LOCAL CAPACITIES)
25. What do you need to get there? (NEEDS)
26. Which solution should have the highest priority? What is the most important action to take? (PRIORITIZATION)
27. Who should be targeted by this action as a priority? Why ?

Interview Guide: Social Status & Workload of Men

1. What does your daily routine look like? (Cf. [daily activities](#))
2. Does your routine change during the year? If yes, how? (Cf. [Seasonal Calendar](#))
3. How do you perceive your workload? How do you feel ?
4. When do you feel most busy or tired? What do you do when you feel like that? Do you have someone to help you ?
5. Has the daily routine changed in the last 10-15 years? Do you do things differently from your parents / grandparents? Explain. (Cf. [Historical Calendar](#))
6. Are there differences in daily routines between different households? If so, what differences ? What characterizes these households ?
7. How does your daily life differ from that of women?
8. Did you go to school when you were younger? What are the reasons why boys do not go to school in your community? What are the reasons they drop out of school ?
9. How is decision-making power within the household shared? (PROBE: [schooling, marriage, household expenses, meal composition, daily activities, workload, postpartum rest, medical treatment in case of illness, family planning?](#))
10. What opportunities do men in your community have? (PROBE: [What role can young men aspire to play in their community as adults?](#))
11. What do you think of these possibilities - are they sufficient? If not, what is missing? What would you like to change / do differently? What's stopping you from doing it?
12. Do you feel safe in your community? Has there been a change in community relations in the last 10-15 years? (Cf. [Historical Calendar](#))
13. What activities do you usually attend with other members of the community? Are there any opportunities that you celebrate together? (Cf. [Seasonal Calendar](#))
14. If you have a problem, who will you see to help you? What was the most recent situation when you needed someone's help? Explain.
15. What can cause confusion/ holla holla in your home? How do you sort your confusion?

Recommendations

16. Have you tried to solve these problems individually / collectively at the community level? If yes, how?
17. How do you think they could be solved? (SOLUTIONS)
18. Are there any obstacles to getting there? (OBSTACLES)
19. What could be done on your side? (LOCAL CAPACITIES)
20. What do you need to get there? (NEEDS)

Which solution should have the highest priority? What is the most important action to take? (PRIORITIZATION)

Who should be targeted by this action as a priority? Why?

Interview Guide: Sources of Income & Agricultural Production

1. What are the main sources of income in your community (M / W separately)?
2. Do they vary during the year? (Cf. [Seasonal Calendar](#))
3. Have they changed in the last 10-15 years? (Cf. [Historical Calendar](#))
4. What caused the change ?
5. How much does the typical household make in a month?
6. What challenges do you face in agriculture? (PROBE: [access to water / land, soil degradation, unavailability of seeds / tools / know-how / work, cost of labor, plant diseases, market access for sale, price fluctuations in period sowing / harvesting, fluctuations in market demand, quality requirements](#))
7. Do these challenges vary during the year? (Cf. [Seasonal Calendar](#))
8. Have these challenges changed in the last 10-15 years? (Cf. [Historical Calendar](#))
9. What caused the change?
10. What are the consequences for your household income?
11. What challenges do you encounter in livestock management? (PROBE: [access to water / grazing / vaccination, animal diseases, unavailability of know-how, market access for sale, price fluctuation, fluctuation of market demand, quality requirements](#))
12. Do these challenges vary during the year? (Cf. [Seasonal Calendar](#))
13. Have they changed in the last 10-15 years? (Cf. [Historical Calendar](#))
14. What caused the change ?
15. What consequences do they have on your household's income?
16. What coping strategies are you deploying to offset potential losses? (Cf. [Coping Strategies](#))

Recommendations

17. Have you tried to solve these problems individually / collectively at the community level? If yes, how ?
18. How do you think they could be solved? (SOLUTIONS)
19. Are there any obstacles to getting there? (OBSTACLES)
20. What could be done on your side? (LOCAL CAPACITIES)
21. What do you need to get there? (NEEDS)
22. Which solution should have the highest priority? What is the most important action to take? (PRIORITIZATION)
23. Who should be targeted by this action as a priority? Why ?

Interview Guide: Market Access, Use of Resources and Coping Strategies

1. What markets do you normally use? How long does it take you to get there?

2. Does your access vary during the year? (Cf. [Seasonal Calendar](#))
 3. Has your access changed in the last 10-15 years? (Cf. [Historical Calendar](#))
 4. What caused the change? What consequences does this have on your household?
 5. Are products available all year round? If no, what and when is not available? Why? (Cf. [Seasonal Calendar](#))
 6. Has the availability of the product changed in the last 10-15 years? (Cf. [Historical Calendar](#))
 7. Are product prices stable throughout the year? If no, which product prices fluctuate? When? Why? (Cf. [Seasonal Calendar](#))
 8. Have product prices changed over the last 10-15 years? (Cf. [Historical Calendar](#))
 9. How do you use your household income? (Cf. [Household expenses](#))
 10. Who makes the decision regarding household expenses? (PROBE: [purchases \(various categories\) vs. sales of agricultural production](#))
 11. Do women receive a weekly allowance? If so, how much and for what? Is it enough? Why / why not?
 12. Do men and women spend differently? If yes, how? Why?
 13. Where do you usually get your food? (PROBE: [agricultural production, purchase, food aid, barter / exchange, picking / hunting](#))
 14. Does this vary throughout the year? (Cf. [Seasonal Calendar](#))
 15. Has this changed in the last 10-15 years? (Cf. [Historical Calendar](#))
 16. How do you make sure you have enough food for your household throughout the year?
 17. What do you do when you do not have enough money to feed your household? (PROBE: [destocking, sale of productive assets, sale, use of excessive debt, reduction of daily food intake and number of daily meals, migration for work, etc.](#))
 18. Are some households in your community more vulnerable to food insecurity? Why?
- Recommandations
19. Have you tried to solve these problems individually / collectively at the community level? If yes, how?
 20. How do you think they could be solved? (SOLUTIONS)
 21. Are there any obstacles to getting there? (OBSTACLES)
 22. What could be done on your side? (LOCAL CAPACITIES)
 23. What do you need to get there? (NEEDS)
 24. Which solution should have the highest priority? What is the most important action to take? (PRIORITIZATION)
 25. Who should be targeted by this action as a priority? Why?

Interview Guide: Migration & Community Solidarity

1. How would you describe access to land in your community? (PROBE: [source \(inheritance / purchase / credit / lease / other\), property \(M / F\), size, distance, geographical and seasonal accessibility, quality, access to water / irrigation, taxes / fees](#)).
2. Has access to land changed over the last 10-15 years? (Cf. [Historical Calendar](#))
3. What consequences does access to land have on your agricultural production? (PROBE: [crop selection, crop rotation, use of natural / chemical fertilizers](#))
4. How do you approach these challenges?
5. Do members of your community tend to form community groups / associations / organizations? If so, for what purpose? (PROBE: [membership \(M / F\), fees, activities, benefits, external support \(government, NGOs\)](#))
6. Do members of your community tend to save money / resources? If so, for what purpose? What are they saving? How?

7. Do people in your community have access to credit? If so, how does it work? (PROBE: [who can access it \(M / F\)](#), [supplier](#), [amount](#), [interest](#))
8. Do people in your community tend to have debt? Why? How? What do they do when they can not repay them?
9. Do members of your community tend to migrate? If yes, who is migrating? Or ? When ? For how long ? Why ? (Cf. [Seasonal Calendar](#))
10. Have migration trends in your community changed over the last 10-15 years? (Cf. [Historical Calendar](#))
11. What are the consequences of migration or changing migratory flows on the remaining members of a household? (PROBE: [income](#), [workload](#), [decision making](#), [nutrition](#), [health](#), [hygiene and childcare practices](#))
12. Apart from migration for farming reasons, do people in your community tend to leave the village for long periods (weeks / months)? If so, who leaves? Or? When? For how long? Why? (Cf. [Seasonal Calendar](#))
13. Does he travel with children? If so, what consequences does this trip have for them? (health, care and hygiene practices)
14. Narration: *XX and YY got together when they were 15 and have a four month old child. XX decides to migrate to ZZ (NAME of local concession area) for work, while YY stays in the town with the new child. She has dropped from school to take care of the baby. XX promises to send back money and return every three months with food for the family.*

What do you think of this story? What do you think of YY's situation? Do women in your community face the same difficulties? Why / why not? What would you do differently ?

Recommendations

15. Have you tried to solve these problems individually / collectively at the community level? If yes, how?
16. How do you think they could be solved? (SOLUTIONS)
17. Are there any obstacles to getting there? (OBSTACLES)
18. What could be done on your side? (LOCAL CAPACITIES)
19. What do you need to get there? (NEEDS)
20. Which solution should have the highest priority? What is the most important action to take? (PRIORITIZATION)
21. Who should be targeted by this action as a priority? Why ?

Interview Guide: Life Perspectives (Parents)

1. Games: If you should describe your life through a song, which one would you choose? Why ?
2. What did you hope to achieve in your life? Have the circumstances allowed the complete / partial realization of your dreams? Why / Why not? What do you feel about your dreams / reality? (PROBE : [satisfaction](#) / [dissatisfaction](#) / [fulfillment](#) / [disappointment](#), etc.)
3. How did you describe how your parents interacted with you and how you interact with your children? What has changed in the meantime? Why?
4. Were you used to discussing various topics with your parents? Do you usually do it with your children? Why / Why not?
5. Are there disagreements between young people, their parents and / or grandparents? Why / Why not? What values do you share / share with younger generations? Why ? What do you blame most for your children? Why ?

6. How did you describe the ideal man / woman when you were younger? Why do you think these features are important? Where does this ideal come from? Is there a book / movie / other that describes this type of man / woman? (Cf. Gender boxes)
7. Do men / women in your community come close to this ideal? Why / Why not?
8. What do you think are the most common problems between women and men? Why do they exist? (PROBE: (if not mentioned by participants, what do you think about jealousy / infidelity?)) How is confusion sorted?
9. What do you never tolerate in your relationships? Why ? (PROBE: Physical / Psychological / Sexual Abuse) Do these behaviors exist in your community? Why / Why not?
10. If needed, who do you seek advice / help from? Who has the greatest influence on your decisions? Why ?
11. What work / development opportunities do you have in your community? What do you think of these possibilities - are they sufficient? If not, what is missing?
12. How do these opportunities influence how you live in your families / community?
13. Feel safe in your community? What activities do you usually attend with other members of the community?
14. Which institutions are of greatest value to you in your life? (PROBE: family / diaspora / school / church / state / international aid). How has their role changed over time?
15. (If not mentioned above) : What role do traditions play in your community? Is this different than when you were a child? (If traditional societies are not mentioned, probed about ways girls/ boys learn from family members and other community members)

Interview Guide: Outlook for Life (Young Men / Women)

1. What do you hope to achieve in your life? Will the current conditions allow you to complete your dreams? Why / Why not?
2. What work / development opportunities do you have in your community? What do you think of these possibilities - are they sufficient? If not, what is missing ?
3. How do these opportunities influence how you live in your families / community?
4. Looking at the life of those around you, what do you feel? (PROBE: satisfaction / dissatisfaction) Why?
5. Are there disagreements between young people, their parents and / or grandparents? Why / Why not? What values do you share / share with the generations of your parents / grandparents? Why? What do you blame most for your parents / grandparents? Why ?
6. If all the conditions were right, how would you like to live your life? How do you imagine your ideal life?
7. Where do these ideals take root? Where did you observe this kind of life?
8. From this ideal, what do you think you will be able to achieve even if not everything will be achievable?
9. Are there people who can help you achieve these dreams? What do your parents think about your dreams?
10. How did you describe the way in which you interact with your parents? Do you often discuss various topics?
11. How did you describe your childhood? What events / memories have you noticed the most? Why ?
12. How do you perceive the relationships of your parents? Do they represent the ideal you are looking for in your life as a couple? Why / Why not ?
13. Do you think that you will manage your own home in the same way as your parents? Why / Why not? What will you do differently?

14. How did you describe your ideal man / woman? Why do you think these features are important? Where does this ideal come from? Is there a book / movie / other that describes this type of man / woman?
15. Does your ideal man / woman exist in your community? If not, where will you find him? If you are not going to find him, what type of man / woman will you choose instead?
16. When needed, who do you seek advice / help from? Who has the greatest influence on your decisions? Why ?
17. What do you think are the most common problems between women and men? Why do they exist?
18. Do you think you will have the same type of problems in your relationships? Why / Why not? (PROBE: (if not mentioned by participants, what do you think about jealousy / infidelity?))
19. What do you never tolerate in your relationships? Why ? (PROBE: Physical / Psychological / Sexual Abuse) Do these behaviors exist in your community?
20. Do you feel safe in your community? What activities do you usually attend with other members of the community?
21. (If not mentioned above) : What role do traditions play in your community? (If traditional societies not directly mentioned, ask about other ways boys/ girls learn from family members or members of their community members)

Interview Guide: Water, Sanitation and Hygiene

1. Where do you find water for your household? Do you use a different source for drinking / cooking / bathing / animal consumption / agriculture?
2. Does your source change during the year? (Cf. [Seasonal Calendar](#))
3. Has your source changed in the last 10-15 years? (Cf. [Historical Calendar](#))
4. Does anyone manage this water source? Are there any conditions of use?
5. Do you have enough water for your needs throughout the year? If no, when? (Cf. [Seasonal Calendar](#))
6. Has access to water changed in the last 10-15 years? (Cf. [Historical Calendar](#))
7. Do all members of the community have the same access to water? If not why? Who are they?
8. Who is responsible for collecting water for the household?
9. How long does it take to get water? (NB: time of arrival at the water point, queue, time of return of the water point). Does this change throughout the year? (Cf. [Seasonal Calendar](#))
10. How much water do you collect during a day? Does this change throughout the year? (Cf. [Seasonal Calendar](#))
11. Has this changed in the last 10-15 years? (Cf. [Historical Calendar](#)) How? Why? What are the consequences of these changes?
12. Are there toilets in your community available to use?

Game of Agree/ Disagree (+ DEBRIEFING)

1. The water in my community is good to drink.
2. The water in my community causes us stomach problems.
3. Water in my community makes children sick.
4. The water in my community is clear.
5. I wash my hands and body in the morning.
6. I wash my hands after a visit to the toilet.

7. I wash my hands before cooking.
8. I wash my hands before eating.
9. I do not wash my hands often because there is not enough water in my community.
10. I do not wash my hands often because I have to keep it for another use.
11. I do not think I need to wash my hands often, we have always lived this way.
12. I buy soap every time I go to the market.
13. The soap is sold at a good price.
14. I do not like latrines.
15. I do not need a latrine at home. I spend a lot of time working away from home.
16. I do not need a latrine at home. It is more natural to meet our needs in the open.
17. I wash my baby every time he's dirty.
18. I let my baby play outside the house.
19. There are animals roaming around my house.
20. There are animals wandering in my house.

Risk game (+Debriefing)

1. Drink water at the water point.
2. Drink water in the creek.
3. Drink rainwater.
4. Leave the water tanks open.
5. Let the flies sit on a meal dish.
6. Eat without washing your hands.
7. Cook without washing your hands.
8. Do not wash your hands after defecation.
9. Child defecate around the house.
10. Cleaning a latrine.
11. Baby playing in the mud.
12. Baby in contact with pets.
13. Animals wandering in the house.

Courage to change (+ DEBRIEFING)

1. Water supply
2. Water treatment
3. Washing hands
4. Bathing
5. Open defecation
6. Use of a latrine
7. Cleaning a latrine
8. Purchase of soap
9. Cleaning a house
10. Cleaning a yard
11. Laundry
12. Food storage

Recommendations

16. Have you tried to solve these problems individually / collectively at the community level? If yes, how?
17. How do you think they could be solved? (SOLUTIONS)
18. Are there any obstacles to getting there? (OBSTACLES)
19. What could be done on your side? (LOCAL CAPACITIES)
20. What do you need to get there? (NEEDS)

21. Which solution should have the highest priority? What is the most important action to take?
(PRIORITIZATION)
22. Who should be targeted by this action as a priority?

Interview Guide: Community Beliefs & Awareness Activities

1. How would you describe an ideal baby? (Size / characteristics / behavior)
2. What can you do to have such a baby before / after birth?
3. Has the image of the ideal baby changed in the last 10-15 years? Why?
4. Do you feel pressure from your family / neighbors / community to have an ideal baby? If so, what do they say / do they do?
5. What happens if someone's baby does not meet this criterion? What are the consequences on the reputation of the household in the community?
6. Have you noticed that some mothers / fathers care for children differently? How? 'Or' What? How do you feel about this?
7. Have you noticed that some mothers / fathers neglect their children? What do they do or do not they do? Why / why not? What are the consequences for the growth and development of these children?
8. What do you think is very important for the healthy development of children? Do all parents do it? Why / why not?
9. What do you think of vaccination? (PROBE : access, availability, cultural acceptability, etc.)
10. Do you attend sensitization sessions organized by health workers or community development workers from different NGOs? Why / why not?
11. Who is invited to these awareness sessions? Are there other people who should be included? Why?
12. What do you think about the different topics they talk about? Have you found them useful / relevant / easily applicable? Why / why not?
13. With what behaviors did you particularly struggle? Why? (Advantages disadvantages)
14. Are there people in your community who do not approve of certain messages / behaviors? Who? Why? (APPROVAL)
15. What should be improved? (SOLUTIONS)
16. Are there any obstacles to getting there? (OBSTACLES)
17. What could be done on your side? (LOCAL CAPACITIES)
18. What do you need to get there? (NEEDS)
19. Which solution should have the highest priority? What is the most important action to take?
(PRIORITIZATION)
20. Who should be targeted by this action as a priority? Why?

Annex 5: Community Recommendations

District	Major Risk factors	Proposed community Recommendation
SO 19 Kahda	Low Birth spacing and unwanted pregnancies	<p>Conduct community engagement on family planning options through key leaders i.e. IMAM, men and women counterparts to get a socially and religiously acceptable solution.</p> <p>Demystify and have correct information on Breastfeeding as a method of family planning which is being used and widely accepted natural family planning method.</p> <p>v Improving girl's access to education will delay age at marriage and give women better control of their reproduction.</p>
	Low access to availability of incomes	<p>Social support for poor households, newly arrived refugees and evicted IDPs; Develop community level saving and loans associations; Participation in voluntary skill training – including entrepreneurship skills.</p>
	Low access to water	<p>Subsidize the cost of water to poor households and more so new IDPs, Assessment of water points coverage and distribution, to ensure majority of household's access water within the sphere standards guideline. Sensitization of households on water management to avoid contamination.</p>
SO 05 Goldogob	Low access to health centers	<p>Construction of dispensary or health post and ensure adequate supply of drugs, personnel and other equipment. The community request prioritized ANC, delivery and PNC equipment for the hospital. Reliable outreach services, improved package and frequency of visit and supported Mobile and emergency medical services. <i>Community contribution: transportation of the equipment to the facility and labour contribution</i> Additionally, behavior change communication will be important to increase the utilization of the existing services.</p>
	Low access to food	<p>Some communities were ready to cultivate if irrigation water and seeds are made available; Training/skills for backyard gardens for home use vegetables in villages where there is an adequate borehole. Responding to marketing functionality, improve income and social support risk factor will improve access to food.</p>
	Low access to availability of water	<p>Extension of water system from borehole to far villages and periphery households, with community The community was willing to make in-kind contributions – labour.</p>
SO 15-16 Baidoa	Low Birth spacing	<p>Need to design a culturally acceptable birth spacing methods, as conventional methods are not acceptable to the community. The community prefers natural birth spacing using breastfeeding as a method.</p>
	Poor Hygiene practices	<p>Community sensitization on promotion of good hygiene practices such as hand washing with soap at critical times, need to construct toilets.-can sensitize of CLTS which worked in one of the villages as mentioned by the community. Technical support for addressing latrine collapse that has become a challenge for those members of the community who are willing to dig pit latrines. IDPs section leaders to initiate community sensitization to promote good hygiene practices(hand washing with soap at critical times, latrine use and solid waste management)</p>
	Women Workload	<p>Initiate programs to sensitize men on the need to support their women to lessen their daily workload: Cultural and societal norms, burden women with a lot of work than their men counterparts. With the confession of men that, the ranking exercise has turned out to be a “sensitization session and they really have the picture of the women workload” and the promise to get involved in the domestic support of women programs can be designed to give more sensitization of men on the effects of women work load on their children health.</p>

		<p>Forming women groups for business activities for women like starting small businesses for women, which can help women to get the needed income as well as being able to take their children to workplace Advocate for women supported so that they will then engage in income generating activities.</p> <p>Equipping women with technical skills such as cookery, tailoring, beauty skills(henna, painting of hands for women)</p>
SO 13 Beltweyne	Low access to health centers	<p>Advocate for a permanent MCH in the camp that serves than the existing mobile MCH that serves them for only 3 days a week.</p> <p>NGOs be encouraged to have a joint strategy and will be advised to do sequencing, layering and integrating so that they can avoid duplication.</p>
	Low availability of water	<p>Community members to refurbish the destroyed wells in the community and help dig new ones themselves.</p> <p>Provision of water treatment and purification chemicals/equipment to the population.</p>
	Poor hygiene practices	<p>Community leaders to work closely with community members to help restore all the damaged latrines as a result of the floods.</p> <p>Camp leaders to sensitize the community to promote good hygiene practices (hand washing with soap at critical times, solid waste management and latrine use)</p> <p>NGOs and government need to support community based sensitization on good hygiene practices to maintain and strengthen the awareness promotion activities in the camp.</p> <p>Provision of sanitation tools such as rakes, spade and wheel barrows.</p>

Increase in Malnutrition cases												
Reduced access to food												
Breastfeeding (changes in mothers daily routine)												
Reduced Men workload												
Increased in Migration												

D. SO 13, Beltweyne district

Risk factor	J	F	M	A	M	J	J	A	S	O	N	D
Long rains												
Short rains												
Low access to HH Income sources												
Increase in women workload (IDPs)												
Low access to health services												
Increased patient consultation at the MCH												
High prevalence in diarrhoea												
High prevalence in respiratory tract infections												
High prevalence in Malaria												
Low access to water availability												
Increase in Malnutrition cases												
Reduced access to food												
increase Breastfeeding (changes in mothers daily routine)												
Reduced Men workload												
Increased in Migration (men)												

Annex 7: Historical Timeline

1991	Drought in Somalia and the onset of a decade-long civil war after collapse of the Somali government.
1992	An estimated 300,000 Somalis died of drought/violence with 1.5 million people facing imminent starvation and five million dependents on food aid.
1995-2010	Hundreds of thousands of Somalis flee to neighboring countries for security.
2006	The Horn of Africa crisis – six million people required humanitarian assistance.
2006 - 2007	The Transitional Federal Government with the support of Ethiopian armed forces ousted the Union of Islamic Courts from Mogadishu. Intense fighting in March and April 2007 led to intense displacements with an estimated population of 350,000 fleeing Mogadishu according to the UN. There has been back and forth movement of population into and out of Mogadishu over the years due to conflicts and drought.
2011	The country experienced one of the world’s worst droughts in 60 years, resulting in the worst annual crop production in 17 years, excess mortality, and high food prices. Large populations arrived in Mogadishu in search of humanitarian support and other opportunities as humanitarian services were restricted in the villages of origin due to the Al Shabaab ban on NGOs operations in the areas.
2013	Drought and flooding in parts of Southern Somalia. MSF that was providing health and nutrition services in large parts of the country pulled out of Somalia following of its staff resulting in downscaling of these services, especially in Mogadishu.
2014 – 2015	Increased secondary displacements due to insecurity in Mogadishu. According to the UNHCR, a total of 32,500 people was displaced in 2014, while forced eviction of IDPs in Dharkenley by the security forces of 21,000 people in March 2015 led to mass movement of IDPs into Kahda.
2017	A twin eviction, the worst single eviction occurring in December 2017 ¹⁷¹ resulted in displacements, total destruction of critical livelihood assets and disruption of life routines.

¹⁷¹ NRC, 2018; Back to Square One

Annex 8: Daily Activities Charts

A. SO 19, Kahda District

Time	Host Community		IDP / Urban poor	
	Men	Women	Men	Women
4:00am	Wakes and prepares for prayers. Goes to the mosque	Wakes up. Preparation of breakfast.	Wakes up. Prepares for prayers and goes to the mosque.	Wakes up. Preparation of breakfast. Homestead cleaning.
5:00 am	Prayers.	Prayers.	Prayers.	Prayers.
6:00am	Goes back home after prayers.	Domestic chores; sweeping, collecting water from standpipe, washing babies.	Leaving home. Children will take breakfast if there was a balance from the super the previous day. Goes out to look for manual labour work.	Fetching of water.
7:00am	Takes breakfast at home.	Feeding of children.	Reports to the workplace. Breakfast at the place of work.	Still searching for labour work. Moving from one house to another.
8:00am	Reports to workplace; shop, hotel, market stalls, construction sites, offices.		Starts the labour work.	Manual labour starts; washing clothes, carrying of items from one shop to another.
9:00am	Present at place of work.	Going to the market.	Present at place of work.	Present at place of work.
10:00am	Present at place of work.	Coming back home with food and other supplies bought. Begins food preparation. Feeding of children	Present at place of work.	Present at place of work.
11:00am	Present at place of work.	Lunch preparation.	Present at place of work.	Present at place of work.
12:00pm	Closure of work. Prayers at the mosque.	Prayers at home.	Prayers at place of work.	Prayers at place of work.
1:00pm	Lunch at home. Rest.	Lunch at home. Rest.	Lunch at the place of work. Work continues.	Lunch at the place of work. Work continues.
2:00pm	Report back to workplace.	Resting at home.	Present at place of work.	Present at place of work.
3:00pm	Present at place of work	Resting at home.	Present at place of work.	Present at place of work.
3:30pm	Prayers at the mosque.	Prayers and preparation of tea.	Prayers at the place of work.	Prayers at the place of work.
4:00pm	Closure of work activities.	Serving children tea.	Present at place of work.	Present at place of work.
5:00pm	Strolls to meet friends at the marketplace. Preparation for prayers.	Preparation of super. Bathing of children. Preparation for prayers	Closure of workplace. Moving back home. Preparing for prayers.	Closure of workplace. Moving back home. Fetching water. Looking for firewood. Preparation of super. Sweeping the compound.
6:00pm	Prayers in the mosque.	Prayers at home.	Prayers in the mosque.	Prayers at home.

7:00pm	Super at home. Prayers in the mosque.	Serving the family super (children). Prayers at home.	At home with the family. Prayers in the mosque.	Super preparation. Prayers at home.
8:00pm	At home eating super.	Serving super to adults.	At home waiting for super.	Super for all served.
9:00pm	Sleeping.	Final domestic chores of washing utensils.	Preparing for sleep.	Still serving super. Cleaning of the children.
10:00pm	Sleeping.	Sleeping.	Sleeping.	Completion of domestic chores. Preparation for sleeping.

B. SO 05, Goldogob district

Time	Host Community		Pastoral community	
	Men	Women	Men	Women
4:00am	Wakes up and prepares for prayers. Goes to the mosque.	Wakes up. Preparation of breakfast.	Wakes up. Prepares for prayers.	Wakes up. Prepares for prayer.
5:00 am	Prayers at the mosque.	Prayers. Waking up children for Islamic school. Prepare and serve breakfast.	Prayers and takes morning tea.	Prayers. Prepare breakfast. Prepare utensils for milking the livestock. Wakes up children and washes them.
6:00am	Takes breakfast from home.	Serves breakfast. Feeding and washing babies.	Prepare livestock and milking of livestock.	Support in milking the livestock. Breastfeeding.
7:00am	Prepare to leave home for work.	Feeding of children/babies and washing them. Children go to school.	Takes breakfast. Takes livestock out of the shed to the grazing.	Serves breakfast. Feeding younger children.
8:00am	Reports to workplace; shop, hotel, market stalls, construction sites.	Clean the house and sweeping the homestead. Washing utensils. Watching over the children.	Grazing livestock.	Washes utensils. Cleans and puts the house in order. Takes the milk to the market.
9:00am	Present at place of work.	Going to the market and fetching water.	Grazing livestock.	Takes the milk to the market - walking an average distance of 6-8km.
10:00am	Present at place of work.	Feeding the children. Putting the babies to sleep. Begin food preparation.	Grazing livestock.	Sell the milk and buy households supplies.
11:00am	Present at place of work.	Lunch preparation. Watching over the children.	Grazing livestock and watering.	Sell the milk and buy households supplies.
12:00pm	Closure of work. Prayers at the mosque.	Wash children. Serve lunch for the children. Prayers.	Grazing livestock and watering.	Walks back home with household supplies. Fetch water from town or along the way home.
1:00pm	Lunch at home. Rest.	Serve and eat lunch. Wash dishes and put the children to sleep/rest.	Grazing livestock. Prayers.	Walks back home with household supplies and collect firewood along the way. Prayers. Prepare tea and feed children tea with milk.
2:00pm	Resting at home.	Resting at home.	Grazing livestock.	Put the children to sleep. Rest.

3:00pm	Goes back to place of work.	Resting at home.	Grazing livestock.	Resting.
3:30pm	Present at workplace. Afternoon prayer.	Prayers and preparation of afternoon tea. Older children go to Islamic school to learn Quran after taking tea.	Grazing livestock. Prayers.	Prayer. Breastfeeding and washing children.
4:00pm	Present at place of work.	Serving children tea and continue with other domestic work; washing and cleaning spaces.	Grazing livestock.	Prepare afternoon tea and meal.
5:00pm	Leaves for home. Preparation for prayers.	Preparation of super. Bathing of children. Preparation for prayers.	Brings livestock closer to home, comes home and takes tea. Reinforce fencing, support fetching water	Preparation of evening meal and other domestic works: washing, cleaning the compound.
6:00pm	Meeting friends. Prayers in the mosque.	Preparation of super. Prayers. Prepare the house.	Brings livestock to the shed and milking, prayer	Prayers. Washing the children.
7:00pm	At home resting or meeting friends.	Serving the family super (children). Putting the children to bed.	Milking the livestock and rest.	Serve meal to young children and prepare them for bed. Support livestock milking.
8:00pm	Prayers and super.	Serving super to adults. Prayers.	Takes super, prays and prepare for sleep	Serve food for the rest of the family. Put the children to sleep. Prayers.
9:00pm	Prepare to sleep.	Final domestic chores of washing utensils and prepare to sleep.	Sleep	Wash dishes and prepare to sleep.
10:00pm	Sleep.	Sleep.	Sleep	Sleep.

C. SO 15-16, Baidoa district

Time	Host Community		IDP/ Urban poor		Agro pastoral	
	Men	Women	Men	Women	Men	Women
4:00am	Wakes early and prepares for prayers. Goes to the mosque	Wakes up. Preparation of breakfast.	Wakes up. Prepares for prayers and goes to the mosque.	Wakes up. Preparation of breakfast. Homestead cleaning.	Wakes early and prepares for prayers. Goes to the mosque	Wakes up. Preparation of breakfast.
5:00 am	Prayers.	Prayers.	Prayers.	Prayers.	Prayers.	Prayers.
6:00am	Goes back home after prayers.	Domestic chores; sweeping, collecting water from standpipe, washing babies.	Leaving home. Children will take breakfast if there was a balance from the super the previous day. Goes out to look for manual labour work.	Fetching of water.	Goes back home after prayers takes breakfast and proceeds to the the farm to work	Domestic chores; sweeping, collecting water, washing babies Feeding of children. and joins the husband in the farm.
7:00am	Takes breakfast at home.	Feeding of children.	Reports to the workplace.	Still searching for labour work. Moving from one	Working in the farms	Working in the farms

			Breakfast at the place of work.	house to another.		
8:00am	Reports to workplace; shop, hotel, market stalls, construction sites, offices.		Starts the labour work.	Manual labour starts; washing clothes, carrying of items from one shop to another.	Working in the farms	Working in the farms
9:00am	Present at place of work.	Going to the market.	Present at place of work.	Present at place of work.	working at the farm	Working at the farm
10:00am	Present at place of work.	Coming back home with food and other supplies bought. Begins food preparation. Feeding of children	Present at place of work.	Present at place of work.		
11:00am	Present at place of work.	Lunch preparation.	Present at place of work.	Present at place of work.		Coming back home with food and Lunch preparation.
12:00pm	Closure of work. Prayers at the mosque.	Prayers at home.	Prayers at place of work.	Prayers at place of work.	Coming back home from the farm work. Preparation for Prayers at the mosque.	Prayers at home.
1:00pm	Lunch at home. Rest.	Lunch at home. Rest.	Lunch at the place of work. Work continues.	Lunch at the place of work. Work continues.	Lunch at home. Rest. Until 2:00pm	Serve lunch at home for the family member
2:00pm	Report back to workplace.	Resting at home.	Present at place of work.	Present at place of work.	Report back to work at the farm	Attend to household chores
3:00pm	Present at place of work	Resting at home.	Present at place of work.	Present at place of work.	Work at the farm	Return back to the farm
3:30pm	Prayers at the mosque.	Prayers and preparation of tea.	Prayers at the place of work.	Prayers at the place of work.	Return home and go for Prayers at the mosque.	Prayers and preparation of afternoon tea.
4:00pm	Closure of work activities.	Serving children tea.	Present at place of work.	Present at place of work.	Return to the farm for more work	Serving children tea. Domestic chore fetching water, firewood
5:00pm	Strolls to meet friends at the marketplace. Preparation for prayers.	Preparation of super. Bathing of children. Preparation for prayers	Closure of workplace. Moving back home. Preparing for prayers.	Closure of workplace. Moving back home. Fetching water. Looking for	Working in the farm.	Preparation of super. Bathing of children.

				firewood. Preparation of super. Sweeping the compound.		
6:00pm	Prayers in the mosque.	Prayers at home.	Prayers in the mosque.	Prayers at home.	Return home from the farm and preparation for evening prayers	Preparation for super or prayers
7:00pm	Super at home. Prayers in the mosque.	Serving the family super (children). Prayers at home.	At home with the family. Prayers in the mosque.	Super preparation. Prayers at home.	Resting at home or visiting friend within the village	Serving super for the family
8:00pm	At home eating super.	Serving super to adults.	At home waiting for super.	Super for all served.	Night prayers	Night prayers
9:00pm	Sleeping.	Final domestic chores of washing utensils.	Preparing for sleep.	Still serving super. Cleaning of the children.	Retire to bed	Final domestic chores of washing dishes before sleeping
10:00pm	Sleeping.	Sleeping.	Sleeping.	Completion of domestic chores. Preparation for sleeping.		

D. SO 13, Beltweyne district

Time	Host Community		IDP / Urban poor		Agro pastoral	
	Men	Women	Men	Women	Men	Women
4:00am	Wakes early and prepares for prayers. Goes to the mosque	Wakes up. Prepare breakfast.	Wakes up. Prepares for prayers and goes to the mosque.	Wakes up. Preparation of breakfast. Homestead cleaning.	Wakes early and prepares for prayers. Goes to the mosque	Wakes up. Preparation of breakfast.
5:00 am	Prayers.	Prayers.	Prayers.	Prayers.	Prayers.	Prayers.
6:00am	After prayers head s back home	Does domestic chores; such as sweeping, collecting water, washing babies.	Back home to have available food. Goes out to look for manual labour work.	Fetching of water. Washing cloths	Goes back home after prayers takes breakfast and proceeds to the farm to work or see livestock out to graze.	Domestic chores; sweeping, collecting water, washing babies Feeding of children. and joins the husband in the farm.
7:00am	Takes breakfast at home.	Feeding children first.	Reports to the workplace. Breakfast at the place of work.	Searching for labour work.	Working in the farms	Working in the farms

8:00am	Go to work, shop, hotel, market stalls, construction sites, offices.	Prepare children to school/Dugsi	Manual labour work begins	Washing clothes, carrying of items from one shop to another.	Working in the farms	Working in the farms
9:00am	Present at place of work.	Going to the market.	Present at place of work.	Present at place of work.	working at the farm	Working at the farm
10:00am	Present at place of work.	Coming back home with food and other supplies bought. Begins food preparation. Feeding of children	Present at place of work.	Present at place of work.		
11:00am	Present at place of work.	Prepare lunch	Present at place of work.	Present at place of work.		
12:00pm	Closure of work. Prayers at the mosque.	Prayers at home.	Prayers at place of work.	Prayers at place of work.	Coming back home from the farm work. Preparation for Prayers at the mosque.	Prayers at home.
1:00pm	Lunch at home. Rest.	Lunch at home. Rest.	Lunch at the place of work. Work continues.	Lunch at the place of work. Work continues.	Lunch at home. Rest. Until 2:00pm	Serve lunch at home for the family
2:00pm	Report back to work.	Resting at home.	Present at place of work.	Present at place of work.	Report back to work at the farm	Do household chores
3:00pm	Present at place of work	Resting at home.	Present at place of work.	Present at place of work.	Work at the farm	Return back to the farm
3:30pm	Prayers at the mosque.	Prayers and preparation of tea.	Prayers at the place of work.	Prayers at the place of work.	Return home and go for Prayers at the mosque.	Prayers and preparation of afternoon tea.
4:00pm	Closure of work activities.	Serving children tea.	Present at place of work.	Present at place of work.	Return to the farm for more work	Serving children tea. Domestic chore fetching water, firewood
5:00pm	Strolls to meet friends at the marketplace. Preparation for prayers.	Preparation of super. Bathing of children. Preparation for prayers	Closure of workplace. walking back home. Preparing for prayers.	Closure of workplace. walking back home. Fetching water. Looking for firewood. Preparation of	Working in the farm .	Preparation of super. Bathing of children.

				super. Sweeping the compound.		
6:00pm	Prayers in the mosque.	Prayers at home.	Prayers in the mosque.	Prayers at home.	walk home from the farm and preparation for evening prayers	Preparation for super or prayers
7:00pm	Super at home. Prayers in the mosque.	Serving the family super (children). Prayers at home.	At home with the family. Prayers in the mosque.	Super preparation. Prayers at home.	Resting at home or visiting friend within the village	Serving super for the family
8:00pm	At home eating super.	Serving super to adults.	At home waiting for super.	Super for all served.	Night prayers	Night prayers
9:00pm	Sleeping.	Final domestic chores of washing utensils.	Preparing for sleep.	Still serving super. Cleaning of the children.	Retire to bed	Final domestic chores of washing dishes before sleeping
10:00pm	Sleeping.	Sleeping.	Sleeping.	Completion of domestic chores. Preparation for sleeping.		