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DECENTRALIZED EVALUATION FOR EVIDENCE-BASED DECISION MAKING

Decentralized Evaluation

Baseline Report of the WFP Mozambique Gender Transformative and Nutrition Sensitive (GTNS) Programme (2019 to 2021)

Evaluation Report

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Disclaimer

Table of Contents

List of Figures

List of Tables

Executive Summary

ES.1. This document is the Baseline Report (BLR) for the World Food Programme's (WFP) Mozambique Gender Transformative and Nutrition Sensitive Project (GTNS). GTNS is funded by the Austrian Development Agency (3 million Euros) over a two- and a half-year period (2019-2021). The project aims to empower women and adolescent girls and improve nutritional outcomes, including reduced stunting among girls and boys under the age of five in the context of a changing climate. GTNS's primary target group is 1,500 households, comprising 7,500 individuals, including at least 500 pregnant women, 500 adolescent girls, and 750 children under-two years of age. These are to be reached through its Food Assistance for Assets (FFA) and Post-Harvest Loss (PHL) components. Its secondary target group is 5,000 households, comprising approximately 25,000 individuals. These are to be reached through GTNS's Social and Behavioural Change Communication (SBCC) component.

ES.2. GTNS is being implemented in 49 villages located in Chemba District, Sofala Province. This district has weak infrastructure with poor road networks and an inadequate health system, incapable of providing appropriate coverage to meet health needs. There are 12 health units with one unit serving 6,083 persons on average. There is further one hospital bed available for every 1,140 persons and one technical professional for every 1,057 persons. Long distances to health facilities and inadequate drug supplies are common problems. Chemba is prone to floods, drought, and human-wildlife conflicts. Most of its population relies on subsistence production and wild foods, with limited sources of income from agricultural labour and sales of products such as charcoal. Households often resort to employing negative coping strategies, such as reducing the number of meals per day or the diversity of foods eaten and selling off productive assets, which exacerbates early marriage and gender-based violence. Stunting and wasting rates for children under-five at the provincial level are 41.2% and 7%, respectively.

ES.3. The baseline survey is a key component of GTNS's impact evaluation, which forms part of the project's overall evaluation. The evaluation's overall budget is US$250,000, of which US$110,000 was allocated for the baseline survey. The stated objective of the evaluation is to assess the project's contribution to reducing stunting among under-five children and the empowerment of women and girls, and the impact evaluation is designed to meet this objective. GTNS's evaluation is intended to serve the twofold purpose of accountability (by assessing and reporting on project performance) and learning (by generating insights to support and enhance the scaling out of GTNS's integrated intervention model to other contexts). Relevant evaluation questions (see Evaluation Matrix, Annex 3) for the baseline survey (and impact evaluation) include the following:

- To what extent were GTNS's primary target groups exposed to the project's integrated intervention model?
- To what extent were GTNS's knowledge, attitudes, and practices (KAP) outcome indicator targets achieved?
- To what extent did GTNS achieve its higher-level outcome and impact targets, e.g. improve household food security and dietary diversity, empower women, and improve the nutritional status of under-five children?
- Is there evidence (either quantitative or qualitative) that GTNS impacted particular sub-groups of targeted beneficiaries differentially, e.g. those from relatively richer and poorer households?
- Did key components of GTNS's intervention model contribute to the generation of any evidenced impacts more than others or was there significant synergy among these components?

ES.4. The purpose of this BLR and the data that informs it is to serve as a comparison point to assess relative changes in GTNS's outcome and impact indicators during the final evaluation vis-à-vis representative samples of households, women, and children residing in both intervention and comparison villages. It is also intended to support the adjusting of targets set for these indicators.

ES.5. The expected users of this report include:

- The **firms** that will be contracted to undertake endline data collection and the final evaluation.
- The **WFP Mozambique Country Office (CO)** and its partners involved in the implementation of the project, particularly to support decision-making in relation to GTNS's overall evaluation and outcome target adjustment.

- The **WFP Regional Bureau (RB)** will use this report to help guide the CO in managing GTNS's evaluation.
- WFP HQ **Nutrition Division** will use this report to help project stakeholders interpret the nutrition indicators.
- The **WFP Office of Evaluation** will provide independent quality support for overall evaluation and its impact evaluation component.
- The **Austria Development Agency**, as the donor for this project, will use the report to meet its accountability needs as appropriate and help to understand the baseline conditions the project is working to address.

Methods

ES.6. To evaluate GTNS's impact on nutrition, livelihoods, and women's empowerment (Annex 1 indicators), a Non-equivalent Group Design (NEGD) is being used. This is because the communities where GTNS is being implemented were purposively, rather than randomly, targeted. More specifically, three different methods are being used to address both program placement and self-selection bias: community matching using Propensity Score Matching (PSM); difference-in-differences estimation; and two-stage least squares (2SLS) regression.

ES.7. Baseline data collection took place from the 15th of February until the 15th of March 2020. The data accepted for analysis were collected from a total of 640 randomly sampled households (314 and 326 residing in 47 and 49 intervention and control villages, respectively). Anthropometric data were collected from a total of 997 under-five children, 680 children of whom were under the age of two.

ES.8. The baseline survey encountered three noteworthy and non-mitigatable challenges: 1) failure to meet targeted sample sizes across all sampled villages, largely due to lack of adherence to the impact evaluation's inclusion criteria and rejected anthropometric data; 2) the introduction of significant bias, given that GTNS's implementation (FFA component) commenced prior to data collection; and 3) failure to obtain complete data on several mandated outcome indicators, such as the Minimum Dietary Diversity, Women (MDD-W) indicator, given the long length of the survey instrument employed.

Key findings of the baseline data collection and analysis

ES.9. The baseline survey captured data on 18 outcome indicators and one program exposure indicator. In pursuing a NEGD design, it is desirable (but not necessary) for such indicators to be balanced at baseline. This inspires confidence that like is being compared with like. The PSM community matching exercise was undertaken to increase the likelihood of obtaining such balance.

ES.10. The indicators associated with women's empowerment and women with favorable attitudes towards recommended practices and positive health seeking behaviors are statistically balanced across the intervention and control households. However, the baseline values for GTNS's food security outcome indicators are not. This is likely the result of the food assistance that took place through the project prior to data collection. Specifically, GTNS delivered a double food assistance distribution to targeted households in the intervention villages on the 21st of December 2019, nine weeks prior to baseline data collection. Unfortunately, this will water down the ability of the impact evaluation design to measure the full potential impacts of the GTNS project.

ES.11. The table below highlights the BLR's results for each indicator for both the intervention and control villages:[1]

Summary conclusions, recommendations, and lessons learned

[1] Several GTNS's impact and outcome indicators do not appear in this table. Data for several are to be captured at endline or through the planned KAP surveys. See footnotes presented in Annex 1 for further details.

ES.12. The results of the baseline survey validate the relevance of GTNS in the context in which it is being implemented. The nutritional status of children is low, with 39% and 37% of under-fives being stunted in the intervention and control villages, respectively. When disaggregated by gender, we find no significant differences in the prevalence of stunting and its severity between female and male children in the intervention and control samples. While GTNS's food assistance intervention was likely already having an effect at the time of data collection in terms of improving general household food consumption, household dietary diversity is a concern: very few under-five child in either the intervention or control villages reached the cut-off for the minimum acceptable diet for children (MAD) indicator and vitamin A and iron intake is low at the household level. Protein intake is considerably higher in the intervention villages, but also with considerable room for improvement. While not as dire, the other outcomes targeted by GTNS—women's and girl's empowerment, post-harvest loss, and health seeking attitudes and behaviour—are worthy of intervention as well. This is both for their intrinsic importance and as a means of directly and indirectly improving nutritional outcomes. Key recommendations include:

ES.13. **1. *Ensure GTNS's SBCC component adequately delivers nutrition educational messaging and targets men and adolescent boys, as well as women and adolescent girls:*** As presented above, improving dietary diversity is a key issue that needs to be addressed in order to improve nutritional outcomes among both pregnant and lactating women and under-five children. Evidence from other contexts shows that this does not necessarily happen automatically with increased access to food or improvements in income. GTNS's SBCC component is therefore both highly relevant and important. It is also widely acknowledged that changing gender relations necessitates engaging both women and men. Consequently, GTNS's SBCC component should design appropriate interventions that target both, building on insights obtained through the first KAP survey and address undesired attitudes evidenced in the baseline survey, e.g. those related to contraceptive use and early girl marriage.

Summary Table: Baseline Indicator Status

#	GTNS Indicator	Intervention Villages	Control Villages
1.	% of HH benefiting from food assistance	87%	3.4%
2.	Food consumption score (FCS): % of HHs at Acceptable Level	46%	9%
3.	Food Consumption Score-Nutrition (FCS-N)		
	a. Vit A rich foods (daily consumption)	8%	7%
	b. Protein rich foods (daily consumption)	39%	6%
	c. Hem Iron rich foods (daily consumption)	0.7%	0.5%
4.	Household Dietary Diversity Score (HDDS)	4.95	3.17
5.	Food expenditure share (FES): % HHs with 65% FES or greater	28%	48%
6.	Livelihood Coping Strategies Index (LCSI): Average weighted score out of 29	3.7	4.7
	a. % of HHs not undertaking any coping strategy	26%	43%
	b. % of HHs falling under stress category	17%	14%
	c. % of HHs falling under crisis category	4%	5%
	d. % of HHs falling under emergency category	53%	37%
7.	Reduced Coping Strategies Index (rCSI): Average weighted score out of 56	9.4	17.9
8.	Post-harvest losses (PHL): Average % of crop lost post-harvest	31%	26%
9.	Women's decision-making participation		
	a. Decisions on own health care access	93%	95%
	b. Decisions on visiting family members/relatives	90%	93%
	c. Input into agriculture output and income use	76%	71%
10.	Pro-WEAI (average index score)	0.52	0.48
11.	% of under-2 months that made 4+ antenatal care visits	73%	71%
12.	Favorable attitude towards healthcare access & contraceptive use:	11%	6%
13.	Favorable attitude against early marriage: Agree with its negative consequences	26%	33%
14.	Assisted delivery at health facility: % of under-2s delivered at health facility	82%	84%
15.	Health seeking behavior: Healthcare visit or advice when child had cough/fever	89%	89%

#	GTNS Indicator	Intervention Villages	Control Villages
16.	Prevalence of child illness: % with one or more illness in previous 2 weeks	68%	74%
17.	Minimum acceptable diet for children age 6-23 (MAD): % reaching cut-off	1.1%	0%
18.	Prevalence of stunting (%)		
	a. Under-2s	32%	34%
	b. Under-5s	39%	37%
19.	Prevalence of wasting (%)		
	a. Under-2s	8%	11%
	b. Under-5s	6%	9%

ES.14. ***2. Tailor GTNS's KAP and endline surveys to capture data and insights not covered by the baseline survey, including from men and adolescent boys and key contextual barriers that are likely to inhibit desired behavior change.*** The baseline survey captured data on a predefined set of quantitative indicators and did not comprise a qualitative component. Yet, additional context-related insights, e.g. barriers against accessing health care services and diversifying diets, would be useful for informing the detailed design of GTNS's interventions, as would understanding the knowledge and attitudes of men and adolescent boys and how these may change over the course of the project's lifespan. GTNS's planned KAP surveys should therefore be designed to address such prioritized gaps. Data on key indicators, such as MDD-W, not captured during the baseline survey can also be collected during the endline survey, but administering the survey over several sessions is recommended to avoid respondent fatigue and corresponding data quality shortfalls.

ES.15. ***3. Leverage GTNS's FFA and PHL components for sustainability.*** As highlighted above, there is evidence that GTNS's FFA component already made a difference, even following the one double distribution. There is an obvious concern that these benefits could discontinue once the distribution stops. The asset building component of GTNS's FFA component and the PHL component are designed to promote such sustainability. It is therefore critical that these two elements be designed and implemented well.

ES.16. ***4. Consider revising some of GTNS's indicator targets.*** The BLR concludes with GTNS's original indicator targets and recommendations for possible revisions. It should also be kept in mind that the many non-project related factors are likely to shape the trajectory of these indicators. Consequently, attention should be directed towards evaluating how these indicators change over GTNS's lifetime vis-à-vis the households, women, and children in the control villages.

ES.17. In addition to the above recommendations for enhancing GTNS's effectiveness and impact, there are two lessons for guiding future data collection efforts of this nature:

ES.18. ***1. Ensure adequate lead time for data collection preparation and implementation:*** As discussed above, the implementation of GTNS's FFA component commenced prior to baseline data collection. This will seriously affect the impact evaluation's ability to measure the full potential impacts of the project. Understandably, there was pressure to implement planned project activities on schedule. Consequently, in the future, ensure there is adequate time to carryout baseline data collection prior to project activity implementation

ES.19. ***2. Invest heavily in both field-level and remote data collection quality oversight****:* In hindsight, better efforts to check and oversee data quality should have taken place, both remotely through the server operated by ICRAF and in the field. For the former, this requires fulltime dedicated effort, so adequate time and budget should be set aside for this. For the latter, stricter procedures are needed to check, verify, and undertake corrective measures as necessary of inputted data in the field prior to uploading.

1.Introduction

1. This Baseline Report (BLR) is a key component of the impact evaluation for the World Food Programme's (WFP) Mozambique Gender Transformative and Nutrition Sensitive project (GTNS). GTNS is funded by the Austrian Development Agency (3 million Euros) over a two- and half-year period (2019-2021). it is being implemented in 49 villages located in Chemba District, Sofala Province, and it aims to improve women and adolescent girls' empowerment, while increasing nutritional diversity and reducing stunting among girls and boys under the age of five in the context of a changing climate (see detailed project components and budget Annex 9). The impact evaluation is nested within GTNS's overall evaluation. The evaluation was commissioned by the WFP Mozambique Country Office (CO).

2. The evaluation's overall budget is US$250,000, of which US$110,000 was allocated for the baseline survey. The stated objective of the evaluation is to assess the project's contribution to reducing stunting among under-five children and the empowerment of women and girls, and the impact evaluation is designed to meet this objective. GTNS's evaluation is intended to serve the twofold purpose of accountability (by assessing and reporting on project performance) and learning (by generating insights to support and enhance the scaling out of GTNS's integrated intervention model to other contexts). Relevant evaluation questions (see Evaluation Matrix, Annex 3) for the baseline survey (and impact evaluation) include the following:

- To what extent were GTNS's primary target groups exposed to the project's integrated intervention model?
- To what extent were GTNS's knowledge, attitudes, and practices (KAP) outcome indicator targets achieved?
- To what extent did GTNS achieve its higher-level outcome and impact targets, e.g. improve household food security and dietary diversity women's empowerment, and the nutritional status of under-five children?
- Is there evidence (either quantitative or qualitative) that GTNS impacted particular sub-groups of targeted beneficiaries differentially, e.g. those from relatively richer and poorer households?
- Did key components of GTNS's intervention model contribute to the generation of any evidenced impacts more than others or was there significant synergy among these components?

3. Based on the Terms of Reference (ToR) (Annex 2), the main objectives of GTNS's baseline survey are:

- To assess the baseline status of key indicators (Annex 1) before the project takes place, so that GTNS's progress and impact can be evaluated in 2021.
- To help assess whether the targets set for the project are realistic or need to be adjusted.

4. This BLR was produced by World Agroforestry (ICRAF), which also led the design of GTNS's impact evaluation strategy and associated data collection instruments. WFP commissioned ELIM Serviços Lda (herein ELIM) to undertake the baseline data collection exercise. The baseline data collection exercise took place from February 15, 2020 to March 15, 2020. A full overview of the design of the impact evaluation strategy and how it fits in with the overall evaluation is presented in the accompanying Inception Report (IR).

5. The BLR establishes baseline values for key GTNS indicators (Annex 1). It is intended to support the assessment of GTNS's impact and performance during the project's final evaluation (2021). Intended users of this report include:

- The **firms** that will be contracted to undertake endline data collection and the final evaluation;
- The **WFP Mozambique Country Office (CO)** and its partners involved in the implementation of the project, particularly to support decision-making in relation to GTNS's overall evaluation and outcome target adjustment.
- The **WFP Regional Bureau (RB)** will use this report to help guide the CO in managing GTNS's evaluation.
- WFP HQ **Nutrition Division** will use this report to help project stakeholders interpret the nutrition indicators.
- The **WFP Office of Evaluation** will provide independent quality support for overall evaluation and its impact evaluation component.

- The **Austria Development Agency**, as the donor for this project, will use the report to meet its accountability needs as appropriate and help to understand the baseline conditions the project is working to address.

1.1 Overview of the Evaluation Subject

6. Funded by the Austrian Development Agency (3 million Euros), GTNS—which started in June 2019 with an inception period of 3 months and ends in December 2021—aims to improve women and adolescent girls' empowerment and the nutritional status of girls and boys under the age of five in the context of a changing climate. GTNS comprises three main components: Food Assistance for Assets (FFA), Post-Harvest Loss (PHL), and Social and Behaviour Change Communications (SBCC).

7. GTNS's expected and stated impact and outcomes are as follows:
Impact: Women and adolescent girls' empowerment enables improved nutritional diversity and reduced stunting among girls and boys under the age of five in the context of a changing climate.
Outcome 1: Improved availability, diversity, and consumption of nutritious food by women, adolescent girls, and children under-two through gender and nutrition sensitive household and community assets creation and post-harvest loss trainings in Chemba district that contribute to climate risk management.
Outcome 2. Increased women's and adolescent girl's empowerment related to early marriage, sexual and reproductive health, and health seeking behaviours for basic childhood illnesses through intensive SBCC targeted towards men, women, boys and girls.

8. **Geographic Targeting:** GTNS is being implemented in Mulima Administrative Post in Chemba District, Sofala Province (Figure 1). This location was identified through WFP's Integrated Context Analysis (ICA) tool. The ICA is developed with the Government and makes use of historical trend data to identify geographical hotspots for intervention. It assessed Chemba District as category 1, which means that it experiences persistent food insecurity and recurrent natural shocks. Moreover, as per the Integrated Phase Classification Chronic Food Insecurity, Chemba is classified as category 3—severely chronically food insecure.

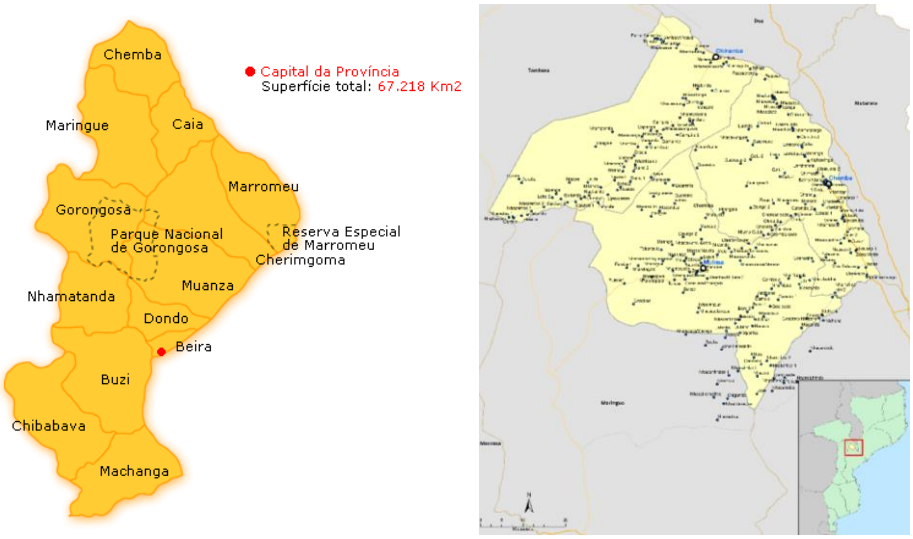


Figure 1: Map of Chemba District

9. **Household Targeting:** Geographic control villages selection is followed by household targeting. GTNS's Food Assistance for Assets (FFA) component aims to fulfil two objectives: to promote the food and nutritional security of households through the provision of monthly food transfers, using cash, vouchers, or in-kind modalities and to enhance the productivity of the ecosystem, thereby supporting the livelihoods of the targeted households. This is being done via GTNS's asset creation and rehabilitation activities, which work at the watershed, community, and household levels. The Post-Harvest Loss (PHL) component is providing technical assistance, information, and farmer training to reduce post-harvest losses, while seeking to improve

the functioning of key food value chains, with a focus on nutritious crops (e.g. orange fleshed sweet potato and biofortified grains and legumes in addition to fruits and vegetables). The PHL intervention focuses on *food processing, conservation, and storage.* Generally, households decide for themselves if they wish to participate in the FFA and PHL components. However, participants must be: abled bodied and willing to work; food and income insecure; of working age; equally men and women; and with livelihoods dependent on the environment.

10. GTNS's **SBCC component** is also targeting the households and communities where the FFA and PHL interventions are being implemented. Three different approaches are being utilized in SBCC: interpersonal, media and community mobilization. The targeting of the interpersonal component is the household couple that is participating in FFA and PHL. These households will participate in gender dialogue clubs that tackle sensitive issues like gender roles and norms, family planning, and early marriage. The media component of GTNS is expected to benefit the community at large with targeted messaging for specific groups (e.g. men, fathers, and adolescent girls). Finally, community mobilization engages community leaders (e.g. CHA, TEA, village leaders, and religious leaders) to target all households within the community to disseminate key messages and link community members to services.

11. **Target group:** The total number of primary beneficiary households is 1,500 (approximately 7,500 individuals), including at least 500 pregnant women, 500 adolescent girls, and 750 children under two-years old. The secondary beneficiaries are 5,000 households (25,000 community members) to be targeted primarily by SBCC activities. Among the primary beneficiary households, a special focus is being placed on the first 1,000 days of the life of the child, from conception until s/he turns two years old, as this is the internationally recognized window of opportunity to impact stunting. Therefore, GTNS is targeting vulnerable households that meet the following criteria:[2] "***Households with a pregnant woman; or a child under two-years of age; or an adolescent girl; or a woman with obstetric fistula***[3]

12. The secondary beneficiaries of the project include:

- At least 100 Community Health Activists (CHA) and Agentes Polivalentes Elementares (APE)[4] trained on optimal dietary diversity practices and family planning and engaged in demand generation for nutritious foods, sexual and reproductive health services, and basic childhood health services
- At least 15 Technico Extensionista de Agricultura (TEA) trained on post-harvest management and technology and optimal dietary diversity practices
- At least 2 agro-dealers engaged to provide hermetic storage products at community level
- At least 1 community radio station and its staff engaged in GTNS to deliver messages and programmes on dietary diversity, the negative impacts of early marriage, the positive impacts of accessing SRH and basic childhood health services, and post-harvest loss technologies using multiple methods, including talk shows, debates, and dramatic series
- At least 5,000 households (25,000 individuals) expected to benefit from SBCC activities, e.g. via the receipt of messages on dietary diversity, the negative impacts of early marriage, the positive impacts of accessing SRH and basic childhood health services, and post-harvest loss technologies using multiple methods including talk shows, debates, and drama series.

13. International policy and guidance posit that, in order to reduce stunting, multi-sectoral and multi-stakeholder programming is required. WFP, with its expertise in food security and nutrition, is delivering a nutrition-sensitive project that spans across agriculture, gender, health, and WASH sectors, thus simultaneously targeting multiple underlying drivers of malnutrition. The project's impact pathway reflects this logic (see Figure 2).

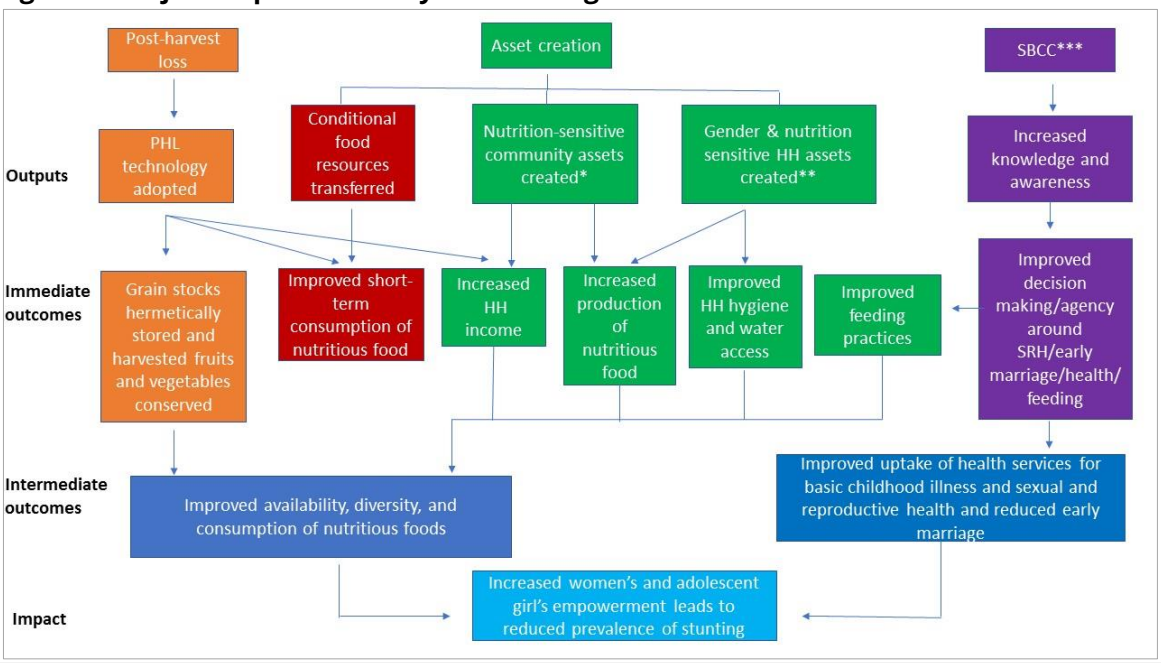
[2] Inter-household targeting will give preference to households that match the target criteria and have disabled members, chronically ill family members, elderly with responsibility for children, female-head households and child-headed households.

[3] Based upon discussion with UNFPA obstetric fistula is included as its own category as it disproportionately affects adolescent mothers, leads to social isolation, and poor quality of life. These women are often turned away for surgery if they are not 'strong' enough and require the benefit of food assistance

[4] APEs are trained community basic health care providers and paid a salary by MOH.

14. A recent evaluation that is relevant to this project is the 2015 evaluation of the WFP Mozambique country programme (CP).[5] This evaluation recommended that "Taking into account the high levels of chronic malnutrition in Mozambique and the priorities of the Government of Mozambique which are to reduce the levels of chronic malnutrition, WFP should prioritize reducing chronic malnutrition in its next CP. In line with global guidance from the World Health Organization (WHO), decisions on targeting for MAM in the nutrition component of the next CP should be based on a careful analysis of inequalities among populations and focus on areas where there are large clusters of wasting children. Finally, in 2015, it should conduct—with external consultancy support and in coordination with other partners (government and UN)—an assessment to identify the reasons for the high levels of MAM default rates seen under the current CP and use the findings to inform the redesign of its interventions".[6] GTNS is therefore a continued effort by WFP to address nutrition issues identified by this evaluation and other studies.

Figure 2: Project Impact Pathway for stunting reduction



* Community assets will be informed directly by the outcome of interest, increased food availability and diversity and could include orange flesh sweet potato, bio fortified crops, fruit orchards, vegetative fencing, irrigation, among others.
** Household assets are gender responsive and nutrition sensitive and pre-defined. The package includes fuel efficient cook stoves, kitchen gardens, small scale water catchment and irrigation systems, and hygiene and sanitation facilities. *** SBCC is focused on increased dietary diversity, increased uptake of SRH and basic childhood health services, reduced early marriage and pregnancy, and improved gender dynamics. It utilizes interpersonal, media, and community mobilization approaches to reach individuals, households, and communities and promote transformative nutrition and gender change

15. **Partnership:** Partnership is crucial for GTNS's success, as WFP aims to break the vicious cycle between malnutrition and disease. WFP is working directly with central, provincial, and district level government authorities across multiple sectors. NGOs are also providing technical assistance to backstop the delivery of interventions at the community level. GTNS is co-located in Chemba alongside the FAO seed multiplication and banking project also supported by the Austria Development Agency.

16. The Provincial Health Directorate (DPS) and the Provincial Agricultural and Food Security Directorate (DPASA) are supporting capacity strengthening of district level staff and volunteers through trainings, supervision, and monitoring of the project. The District Services for Health, Women, and Social Action (SDSMAS), its health facility staff, and network of Community Health Activities (CHAs) are integral for the implementation of the SBCC interventions, especially vis-à-vis community mobilization related to improved feeding practices, sexual and reproductive health, and the delivery of basic childhood health services, in addition to healthcare service referral mechanisms. The District Services for Economic Activity (SDAE) and its

[5] Muriel, et al (2015), "Mozambique, 200286 Country Programme: An Evaluation of WFP's Operation (2012-2015): Operation Evaluation", World Food Programme, Office of Evaluation, Rome -Italy
[6] Ibid

Technico Extensionista de Agricultura (TEA) is to be engaged to support FFA and PHL interventions, including demand generation for PHL technologies.

17. Pathfinder is an international NGO, currently operating in Sofala Province, which delivers services for family planning, specifically to increase the appropriate use of contraceptives. The Country Director is the former Chief Medical Officer of Caia and Chemba District and the organization is familiar with the operational environment. Pathfinder is providing technical support to SDSMAS and CHA related to SBCC and referral mechanisms for sexual and reproductive health and basic health seeking services for children under-two. Pathfinder is also supporting the community-based management of moderate acute malnutrition, utilizing locally available foods and ensuring referral of children with severe acute malnutrition to a Sanitary Unit or Hospital. Finally, Pathfinder is expected to lead dialogue club facilitation on gender equality and women's empowerment that engage both men and women and tackle difficult topics, such as gender-based violence, early marriage, family planning.

18. IREX is an international NGO that provides technical support for local community radio. It delivers a diverse array of radio programming to engage community members on key topics. A multi-pronged approach to SBCC is being employed in this project. In addition to engagement of SDSMAS, CHA, SDAE, and TEA, community radio is to be utilized to issue programme spots, conduct live interviews, host debates, and deliver dramatic programmes. IREX supports local community radio specifically in the content development and methodology for interactive and engaging radio programming.

1.2Study Context

1.2.1 Analysis of the relevant national and sectoral policies

19. Nutrition is both an input and output of all the Sustainable Development Goals (SDGs).[7] SDG 2 (zero hunger), 3 (good health and well-being), 5 (gender equality), 12 (responsible consumption and production), 13 (climate action) and 17 (partnerships) are all relevant to GTNS.

20. **Country Development Priorities and UNDAF:** GTNS supports the Government's 5 Year Programme (PQG) Priority 2 (Developing human and social capital) and aligns with the Mozambique United Nations Development Framework (UNDAF 2017-2020) core programming principles, which are to leave no one behind, uphold human rights, and foster gender equality and women's empowerment, resilience, and accountability. It supports UNDAF Outcomes 1 (Vulnerable populations are more food secure and better nourished) and Outcome 4 (Disadvantaged women and girls benefit from comprehensive policies, norms and practices that guarantee their human rights). This project is a contribution to the WFP Country Strategic Plan (2017-2021) Strategic Outcome 1 (Households in food-insecure areas of Mozambique are able to maintain access to adequate and nutritious food throughout the year, including in times of shock) and Strategic Outcome 4 (Targeted people in prioritized areas of Mozambique have improved nutrition status in line with national targets by 2021).

21. **National policies:** Food security and nutrition are national priorities in the following policy frameworks that align with the objectives of the project:

- Agenda 2025 prioritizes access to food with a view to improving living conditions and developing human capital
- The Government's Five-Year Plan 2015–2019[8] focuses on empowering women and men for gender equity and equality, poverty reduction, economic development, and food security and nutrition
- Strategic Gender Plan 2016-2020 and the 4th National Plan for the Advancement of Women 2018-2021
- The Operational Plan for Agricultural Development 2015–2027 aims to enhance food sovereignty by strengthening value chains, public–private partnerships and farmers' organizations

[7] Global Nutrition Report (2017), http://globalnutritionreport.org/the-report/
[8] This is in the process of updating. It will likely not change substantively and still include stunting as an indicator.

- The National Multi-Sectoral Action Plan for the Reduction of Chronic Undernutrition 2011–2020[9] and its Food Fortification Strategy aim to reduce stunting in children under 5, recognizing wasting in pregnant and lactating women and girls and in children under 2 as risk factors for stunting
- The National Food Security and Nutrition Strategy 2008-2015[10]
- Social Behaviour Change Communication for the Prevention of Malnutrition in Mozambique 2015-2019[11]
- The National Master Plan for the Prevention and Mitigation of Natural Disasters 2017–2030 is the basis for disaster risk management[12]

22. Furthermore, the GTNS programme is aligned with the Government's climate adaptation and mitigation policies, programmes, and priorities including:

- Initial National Communication to UNFCCC (2006)
- National Climate Change Adaptation and Mitigation Strategy (2013 – 2025), calling for increasing the adaptive capacity of vulnerable people, and promoting mechanisms for planting of trees, and establishing forests for local use
- National Adaptation Programme of Action (MICOA, NAPA 2007) that prioritized installing small-scale sustainable irrigation systems and encourage the use of drought-tolerant crops
- Intended Nationally Determined Contribution (INDC) to UNFCCC that also calls for increasing the adaptive capacity of the most vulnerable groups and reducing soil degradation and promoting planting of trees for local use

1.2.2 Characteristics of the intervention environment

23. Despite an average GDP annual growth rate of 7.9% for much of the post-war recovery period (1996-2015), economic expansion has only had a moderate impact on poverty reduction, and Mozambique ranked 180th of 189 countries in the 2017 Human Development Index.[13] The development challenges Mozambique faces are numerous and varied. Rates of malaria and HIV are high, and there is poor and unequal access to improved drinking water and sanitation facilities, as well as health care infrastructure and services. Mozambique is highly susceptible to climate shocks, such as cyclones, floods and drought, as well as economic shocks.[14]

24. **Nutrition:** The Cost of Hunger in Africa analysis for Mozambique found that 10.94% of GDP is lost every year because of stunting (chronic malnutrition). The largest share of this cost is the potential loss of productivity due to malnutrition-related mortality, estimated at 53 billion meticais, or 9.4% of GDP.[15] One out of two children under-five are stunted, 26% of all child mortality in Mozambique is associated with undernutrition, and stunted children complete 4.7 years less schooling. Furthermore, repeated episodes of acute malnutrition increase the likelihood that a child will be stunted and children that are stunted and wasted are 12 times more likely to die than their well-nourished peers.[16]

25. **Gender:** Pregnant women and girls who were chronically malnourished as children, characterized by stunting, are more likely to deliver infants with a low birth weight (<2500g) and to experience life-threatening complications during pregnancy and delivery.[17] In Mozambique, 28% of children under six

[9] This action plan most likely will be updated based upon results of a mid-term review recently conducted and will likely take place in late 2019 or even 2020

[10] This was extended beyond 2015 and has recently been revised. It was presented to the National Council for Nutrition and Food Security (CONSAN) in December 2018 and is awaiting endorsement

[11] It is under discussion whether to extend or update this policy

[12] Additionally, informed by the Strategic Gender Plan of the National Institute for Disaster Management (INGC) 2016-2020

[13] UNDP (2018), retrieved 26 September 2018 from http://hdr.undp.org/en/composite/HDI.

[14] World Bank. (2017). Mozambique Overview. Retrieved October 10, 2017, from http://www.worldbank.org/en/country/mozambique/overview

[15] African Union (AU), NEPAD, World Food Program (WFP), & ECLAC. (2017). Estudo do Custo da Fome em Africa: Impacto Social e Econômico Desnutrição em Crianças em Moçambique: Impacto Social e Económico da Desnutrição Infantil no Desenvolvimento a Longo Prazo de Moçambique a Longo Prazo. Maputo.

[16] Tanya Khara and Carmel Dolan (2014). Technical briefing paper: The relationship between wasting and stunting, policy, programming and research implications.

[17] SETSAN (2013). Baseline Survey for Food Security and Malnutrition. Maputo.

months were already stunted.[18] High stunting prevalence before complementary feeding is indicative of poor maternal nutrition status before, during and immediately following pregnancy, including young age (adolescent pregnancy), as well as poor breastfeeding practices.

26. The most recently published, nationally representative anthropometric survey indicated that the prevalence of stunting (HAZ≤-2) in Mozambique is 43%, classified as *very high* by WHO standards and only a slight reduction from 45% in 1997.[19,20,21] At this prevalence rate, an estimated 2.15 million children aged under five are affected by stunted growth in Mozambique. Consequently, Mozambique ranked 123rd out of 132 countries for stunting prevalence in the 2016 Global Nutrition Report (GNR).[22]

27. **Nutrition and climate change in Mozambique:** Agriculture is one of the key sectors in Mozambique, accounting for 80% of the country's Gross Domestic Product. Seventy percent of agricultural production is undertaken by smallholder farmers in rural areas under rain-fed systems. In this context, climate change and variability have a considerable impact on livelihoods, food security, and nutrition.

28. Floods and drought are the principal climate hazards in Mozambique, with cyclones and tropical storms also a common occurrence. Floods are of concern in areas along the coastline and major river basins. Drought is a major concern in semi-arid areas of the country, including Tete, Sofala, Inhambane, Gaza, and Maputo provinces.

29. A historical climate analysis (WFP, 2018) concludes that temperatures have already been increasing, rainfall variability has worsened, and vegetation coverage has consequently been decreasing. Climate model projections indicate significant temperature increases (2.2°C– 3.3° C) by 2050 and more variable rainfall. In addition, across all projected climate models show increased heat stress, reductions in water availability, and more frequent and intense extreme weather events, which will exacerbate food insecurity and under nutrition.

30. The impacts of climate change are already felt, which include: i) increased mean temperatures during the start of the growing season, resulting in water evaporation and poor planting conditions; ii) reduced rainfall during the growing season, with increased variability, resulting in dry spells and shorter growing seasons; iii) increased in flash flood incidence, when rain events do occur, promoting rainwater run-off and decreased infiltration; iv) decreased production of food staples, including maize, with yield reductions of up to 30-45%; and v) losses in vegetative biomass, thereby reducing grazing areas and livestock health.

31. The implications of climate change for nutrition security merits close attention. Climate change will exacerbate undernutrition through three main causal pathways: i) impacts on household access to sufficient, safe and adequate food; ii) impacts on care and feeding practices; and iii) impacts on environmental health and access to health services. Climate change affects nutrition through food security (reduced production, increased post-harvest loss, and decreased availability), increased disease prevalence and ranges (e.g. malaria, diarrhoea), and reduced dietary diversity and accessibility.[23]

32. **Gender Equality and Women's Empowerment:** Mozambique is a signatory to all regional and international policy frameworks aimed at promoting equal rights for women and men. However, implementation is lacking in all areas and Mozambique is ranked 138th out of 189 countries on the gender

[18] Instituto Nacional de Estatística (INE). (2013). Mozambique 2013 Statistical Yearbook. Maputo: INE.
[19] Instituto Nacional de Estatística (INE). (2013). Mozambique 2013 Statistical Yearbook. Maputo: INE.
[20] WHO. (2017). Global Database on Child Growth and Malnutrition: Mozambique. Retrieved October 12, 2017, from http://www.who.int/nutgrowthdb/database/countries/moz/en/
[21] Estimativas e Perfil da Pobreza em Moçambique: Uma Analise Baseada no Inquérito sobre Orçamento Familiar - IOF 2014/15. Direcção de Estudos Económicos e Financeiros (DEEF), Ministério de Economia e Finanças (MEF), Maputo, Mozambique.
[22] International Food Policy Research Institute. (2016). Global Nutrition Report 2016: from promise to impact: ending malnutrition by 2030. Washington, D.C.
[23] Global Nutrition Report (2015), Climate Change and Nutrition, chapter 6.

equality index.[24] Reports by the United Nations Committee on the Elimination of All Forms of Discrimination against Women indicate that, despite significant advances recorded in several areas, the country still faces several challenges where discrimination against women continues to strongly influence opportunities for the advancement of Mozambican women.[25] Both women and men in rural areas are heavily affected by poverty, but in addition, women and girls also face restrictive gender norms,[26] and gender-based violence (GBV) is widespread. Mozambique has the tenth highest number of child marriages globally, with one out of two girls married before the age of 18 and 40% giving birth to their first child before the age of 18. Adolescent mothers are more likely to die in childbirth and more likely to have negative birth outcomes. The leading cause of death globally for adolescent girls 15-19 is due to complications related to pregnancy and childbirth.[27,28] Young age at first birth also contributes to the high fertility rate of 6.6 in rural areas and a high maternal mortality rate of 489/100,000 live births, one of the highest in the world.

33. **Chemba, Sofala:** Chemba District, Sofala Province, is in the central semi-arid zone with sandy-clay soils and moderate fertility. The district has a surface area of 3,991 km^2, 17,730 households and a total population of 87,925 (41,077 men and 46,848 women). Rain fed agriculture is the main source of livelihood. The average farm size is about 2 hectares, with dominant manual farming practices and limited use of animal traction. The average household size is five people per household.[29] The main food crops grown in this area are maize, sorghum, kidney beans, sesame and peas. Maize is the primary staple food, and the most important livestock species are cattle, goats and pigs. Agricultural productivity is low and affected by the semi-arid climate and low precipitation. Chemba has forestry resources that people use to make household goods and handicrafts. Firewood and charcoal are the main domestic fuels, exacerbating deforestation and erosion, and the district struggles with water shortage problems.

34. Chemba has weak infrastructure with poor road networks and an inadequate health system that cannot provide appropriate coverage to meet health needs. There are twelve health units, each serving and average 6,083 people. There is one hospital bed available per 1,140 people and one technical professional for 1,057 people. Long distances to health facilities and the inadequate supply of drugs exacerbate the situation.

35. Chemba is prone to floods, drought, and human-wildlife conflicts.[30] With large segments of its population[31] only able to rely on subsistence production for only four to five months of the year, consuming wild foods and resorting to casual labour and the sale of products like charcoal are essential coping strategies. The FEWS NET country outlook for December 2018 to May 2019 found that many areas in Sofala, including Chemba, experienced crisis levels (IPC 3) of food insecurity. In addition, there are signs that the situation may worsen. Consumption based coping strategies in Sofala are among the highest (second in the country), which mirror an IPC 3 situation,[32] or higher.

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[24] UNDP (2018). Retrieved on 26 September 2018 form http://hdr.undp.org/en/composite/GII. The gender inequality index is a composite indicator comprised of maternal mortality rate, adolescent birth rate, share of seats in parliament, labour force participation rate, and population with at least some secondary education.

25 United Nations Committee on the Elimination of Discrimination against Women (2018) Combined third to fifth periodic reports submitted by Mozambique under article 18 of the convention.

26 Including 'myths' and traditional beliefs which often restrict women's and girls' access certain foods.

[27] Black et al (2013). Maternal and child undernutrition and overweight in low-income and middle-income countries. Lancet 2013; 382: 427-451.

[28] Black et al (2013). Maternal and child undernutrition and overweight in low-income and middle-income countries. Lancet 2013; 382: 427-451. WHO. Global health estimates 2015: deaths by cause, age, sex, by country and by region, 2000–2015. Geneva: WHO; 2016.

[29] The average household size set by the Government for FFA activities is 5 people per household.

[30] Mozambique does not have the resources to afford separate wildlife conservation areas, and with the growing population, human-wildlife conflict is a key issue, especially as key resources diminish, such as water and vegetation. Sofala, and parts of Tete, where Chemba is located, incidence of human-wildlife conflict has been documented. Crocodiles are the main concern, with others, like hippos.

[31] Based on the ICA, the portion of the population that faces food insecurity in a recurring basis surpasses the established threshold of 20 percent of the population, looking back from 2006 to 2016.

[32] Even with any humanitarian assistance at least one in five HHs in the area have the following or worse: Food consumption gaps with high or above usual acute malnutrition OR Are marginally able to meet minimum food needs only with accelerated depletion of livelihood assets that will lead to food consumption gap

36. Nutrition surveys are conducted at the provincial level and in Sofala Province rates for stunting and wasting for children under-five are 41.2% and 7% respectively. In women of reproductive age, overweight and obesity is 16% and thinness (low body mass index) is 8%, both negatively impact child nutrition. Consumption of iodized salt and access to markets is low at just one in two households.

1.2.3 Harmonization

37. GTNS programme is aligned with the WFP Mozambique Country Strategic Plan 2017-2021, Strategic Outcome 1 and 4 as described under Section 2.1 above. It supports nutrition-sensitive and gender-transformative integration throughout WFP's portfolio of work, specifically related to the following outputs:

- Targeted food-insecure communities benefit from construction and/or rehabilitation of assets that improve food security and build resilience to natural stocks and climate change.
- Targeted households and vulnerable people benefit from improved knowledge in nutrition, care practices and healthy diets to improve their food consumption and nutrition status.
- Targeted food-insecure communities receive conditional cash- and/or food-based transfers to improve their food consumption.
- Vulnerable people in Mozambique benefit from strengthened, evidence-based national capacity to combat stunting and micronutrient deficiencies to improve their nutrition status.

38. At central level the WFP Nutrition Sensitive Project Coordinator, with oversight from the Nutrition Advisor, will coordinate the overall project in collaboration with SETSAN (Technical Secretariat for Food Security and Nutrition), the Ministry of Health and Ministry of Agriculture, and the GT-PAMRDC (Working Group for the National Multi-Sectoral Action Plan for the Reduction of Chronic Undernutrition). The GT-PAMRDC is multi-sectoral and comprised of members from multiple ministries.33 Centrally, SETSAN will be integral to ensure that this project, which is multi-sectoral and will include multiple ministries, is well coordinated and the framework of integrated programming impressed upon its members. SETSAN has participated in nutrition-sensitive trainings at both central and provincial level and is well-placed to disseminate and transmit the main tenets of this approach to addressing chronic malnutrition.

39. At the provincial level, the WFP Beira Sub-Office will coordinate and collaborate with Provincial SETSAN (SETSAN-P), the Provincial Agricultural and Food Security Directorate (DPASA) and the Provincial Health Directorate (DPS) and provide direct supervision to operations at district level. At the district level, the project will be coordinated by the WFP Field Monitor Assistant (FMA) who is based in the district. Letters of Agreement will be signed with District Services for Economic Activity (SDAE) and District Services for Health, Women, and Social Action (SDSMAS) to ensure adequate technical assistance to the target group and appropriation of the project activities to ensure its integration in the district development plans. Community Health Activists (CHA) and agricultural extension agents (TEA) will be engaged specifically for SBCC activities and referral.

1.3 Evaluation Methodology and Limitations

1.3.1 Evaluation Questions

40. Relevant evaluation questions that pertain to the baseline survey and overall impact evaluation are presented in Section 1, while those that pertain to the overall evaluation are presented in the Evaluation Matrix (Annex 3).

41. Figure 3 summarizes the methods associated with GTNS's overall evaluation vis-à-vis the four evaluation criteria (left) and illustrates where the baseline survey is situated. As is clear, the baseline survey and corresponding endline survey will primarily be used to evaluated GTNS's impact. However, data associated with both surveys will also be used to evaluate its effectiveness, particularly on levels of exposure to GTNS's interventions and desired changes in Knowledge, Attitudes and Practices (KAP) among women caregivers. The latter will be complemented by KAP surveys directed at the general population, including men

[33] Ministry of Health, Ministry of Agriculture, Ministry of Finance, Ministry of Industry and Commerce, Ministry of Gender and Social Action, Ministry of Youth and Sports, Ministry of Public Works and Housing, Ministry of Planning and Development and Ministry of Education and Culture

and adolescent boys and girls. This will enable some degree of triangulation, as well as ensuring that data from men and adolescent boys are captured. Focus group discussions, in-depth interviews, documentation and M&E data review will be the primary methods to evaluate the Efficiency and Sustainability/Scalability criteria.

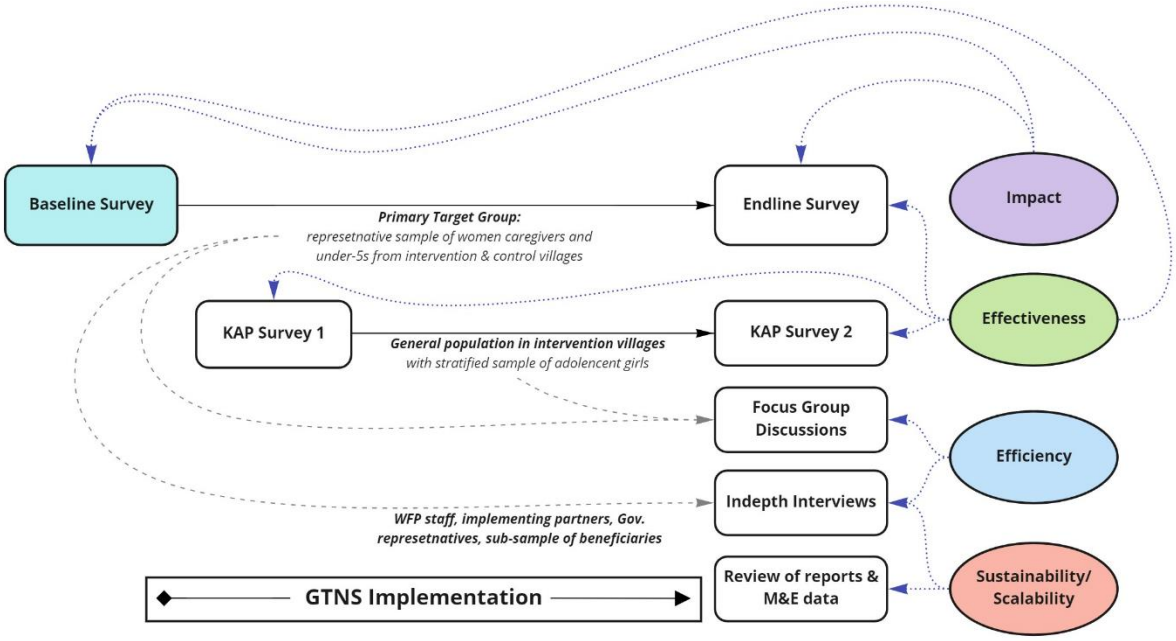


Figure 3: How Baseline Survey is Situated within Overall GTNS Evaluation Design

1.3.2 Impact Evaluation Design (Impact and Effectiveness Criteria)

42. To evaluate GTNS's impact on nutrition, livelihoods, and women's empowerment (Annex 1 indicators), a Non-equivalent Group Design (NEGD) is being used. This is because the communities where GTNS is being implemented were purposively, rather than randomly, targeted. Moreover, households within these communities that meet the project's inclusion criteria and make up GTNS's primary beneficiary group, were targeted through a community-based participatory process. And those that were targeted have the option of participating or not participating in the project's FFA and PHL components. While sensible from a programming point of view, there are two sources of bias that the impact evaluation needs to address:

- project placement bias, i.e. project and control villages may differ in ways that **can** affect the evolution of GTNS's outcome indicators over time, e.g. distance to markets; and
- participant selection bias, i.e. the fact that households that were targeted for and will end up participating in the project in the project villages **may** differ in both observable ways (e.g. education levels) and unobservable ways (e.g. motivational levels) from other non-participating households residing in these same villages.

43. Three methods—elaborated further in the Inception Report—are being used to mitigate both types of selection bias:
a) community matching[34] using Propensity Score Matching (PSM);
b) Difference-in-differences estimation; and
c) Two-stage least squares (2SLS) regression.

1.3.3 Sampling

44. GTNS's 49 intervention communities were targeted prior to the evaluation's design, and PSM was used to identify 49 matched control communities. For control communities comprising more than one village, one was to be selected at random for inclusion in the evaluation's impact evaluation component.

[34] Some communities comprise more than one village. Community, rather than village, matching was undertaken, given that government data are only available at the community level.

45. Household listing was to be undertaken in both the 49 intervention villages and 49 matched comparison villages. In the household listing, the presence of a pregnant/lactating woman and under-2 child residing in each household was recorded. To increase the likelihood there will be sufficient samples of households with under-2s during the endline survey in 2021 who were exposed to GTNS's interventions, the sampling frames filtered from the listing exercise consisted only of households that met two criteria: 1. Under-2 year-old child; AND 2. Pregnant/lactating women.

46. All households in the above 49 intervention and 49 control villages with 1) pregnant women or lactating women AND 2) under-two children were listed.[35] For each village, a sample of eight households were randomly selected, in addition to five reserve households. For smaller villages with less than eight households with pregnant/lactating women AND under-two children, households having either were targeted for interviewing, bringing the total sample size to 784—392 GTNS households and 392 households from the control villages as shown in Table 1.

Table 1: Planned sample size

	Localities	Villages	Households	Pregnant or lactating woman	Children under two years
Intervention group	Mulima-sede	49	392	100%	100%
Control groups	Catulene, Chemba-sede, and Goe	49	392	100%	100%
Total		**98**	**784**	**100%**	**100%**

1.3.4 Survey Instruments

47. The household questionnaire (Annex 4) comprised four main parts: (1) information about the household, including measures of post-harvest loss and food security experience; (2) the Women's Empowerment in Agricultural Index (WEAI) and several complementary questions; (3) information about the sampled pregnant woman/mother of under-2; and (4) information about the sampled under-2 child. Data collected from children included information on feeding practices and anthropometric measures (height, weight, and mid-upper arm circumference [MUAC]). If there were 3-5 year-old children in the household, these same anthropometric data were captured. Given the cultural context, the primary male member of the household, if present, was permitted to participate in the first part of the household survey. However, the woman caregiver was to be interviewed privately for the WEAI module onwards.

48. The anthropometric measurements were to be conducted by the supervisor with the support of one of the enumerators of the team in close collaboration with the caregiver to ensure that the child was as comfortable as possible. The measurements were taken as per the recommendations of the Ministry of Health's Nutrition Department.

49. The data obtained through the interviews and anthropometric measurements were captured on encrypted and password-protected tablets. All tablets had a sim-card and the completed forms—developed using the Open Data Kit (ODK) —were uploaded onto a secure, password protected internet server operated by ICRAF (SurveyCTO) on a nightly basis. After uploading the forms, the collected data were no longer accessible to the enumerators.

1.3.5 Data Collection Process

50. The data collection process was carried out by ELIM simultaneously in the Mulima-sede, Catulene, Chemba-sede, and Goe localities for a period of four weeks (15th of February to 15th of March 2020). The survey team consisted of four sub-teams of five enumerators, each supported by one supervisor. Each sub-

[35] These criteria are to ensure that the household will have a child that was under the age of 2 years for a significant period of GTNS' lifespan by the time the endline data collection exercise takes place. The period between pregnancy and 24 months is the critical window that the project is targeting to reduce the prevalence of stunting.

team was assigned to specific enumeration communities based on the sampling lists. After locating a selected household, the enumerators were to first screen the sampled household to verify if it met the survey's inclusion criteria. Upon realizing that many women in the project's context continue to breastfeed after their child surpasses the age of one year, these criteria were modified, so that each household needed to consist of: 1. an under-2-year-old-child; and 2) a pregnant woman or child under 1. This decision was made just prior to data collection and after the initial household sampling sheets were distributed. This created challenges in the field due to an initial misunderstanding about the revised inclusion criteria (see below), as well as an increased need for more replacement households than the five that were provided on the initial sample sheets.

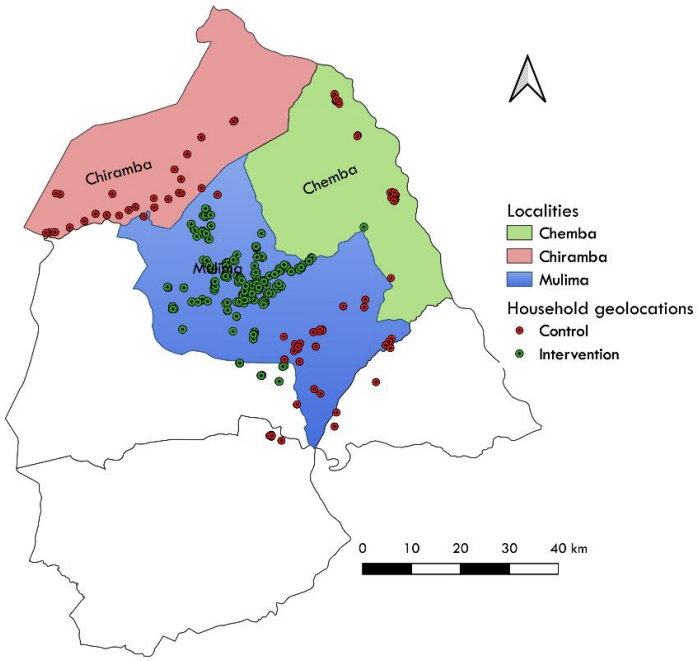


Figure 4: Geolocations of surveyed households

51. Once the inclusion criteria were verified, the enumerator explained the objectives of the survey, read out the confidentiality clause in the introduction, and sought the main respondent's informed consent.

1.3.5 Ethics

52. Ethical protocols were implemented during data collection and enumerators received training in the same ahead of the survey. Standards ensured that participation was voluntary and informed all participants of the implications of participating in the data collection exercise (informed consent). Data analysis was done anonymously, and the data were anonymized and household geocodes removed. This was to ensure that specific responses or findings cannot be traced back to specific households or respondents. A referral system was also set up for cases where the data collection process itself elicited negative reactions on the part of the respondents or where cases of severe malnutrition or domestic violence were identified. (See Inception Report for further details.) A similar approach will be used during endline data collection and for the qualitative interviews that will take place at this time.

1.3.6 Quality Assurance (data validity and reliability)

53. Data submitted onto the SurveyCTO server was further checked and monitored for quality on ICRAF's side through automated workflows, including:

- **Programming the survey instrument** with logical skip patterns, constraints, and the setting of module-specific speed limits. This helped mitigate the making of obvious mistakes during data collection.
- **Automated daily checks.** These were done within the SurveyCTO Monitoring and Visualization platform that automatically identifies outliers, forms with significant missing values, etc. It further

checks for consistency of responses across the survey instrument and the range within which the responses fall.

- **Interval checks**. In addition to the nightly checks conducted within SurveyCTO, more substantive quality checks using in-house automated workflows implemented in R software were carried out.

54. Moreover, the data collected through the two survey modules was thoroughly checked and cleaned. This included the identification of inconsistencies for data associated with specific questions, missing values, and double entries. The quality control of anthropometric data was assessed using the Emergency Nutrition Assessment (ENA) for SMART Software by WFP on a daily basis through the plausibility test. Here, specific statistical tests verified whether measurements were within acceptable ranges as per WHO standards.

55. During the first few days of survey administration, the survey team had not fully realized the importance of adhering to the above and newly modified inclusion criteria. As presented in Table 2, data were collected from a large number of households that did not meet these criteria. These households had to either be replaced or the data collected from them discarded. Moreover, data outside of weight-for-age and weight-for-height WHO standard ranges were excluded from the analysis. This reduced the number of villages from 49 to 47 for the intervention group and reduced total sampled households from 392 for each group to 314 for the intervention group and 326 for the control group (Table 2). This has also introduced variation in numbers of households per village as shown in Annex 6.

Table 2: Obtained and Final Accepted Sample Sizes

	Localities	**# of survey villages planned**	**# of final villages covered**	**Households surveyed [36]**	**HHs meeting inclusion criteria**	**Under 2 children measured**	**Under 2 children accepted**	**Final # number of accepted HHs**
Intervention group	Mulima-sede	49	47	526	327	569	330	314
Control groups	Catulene, Chemba-sede, and Goe	49	49	422	333	503	363	326
Total		**98**	**96**	**948**	**660**	**1072**	**693**	**640**

1.3.6 Limitations

56. **Failure to meet targeted sample sizes with varying sample sizes across villages.** This is explained above. Its primary impact is on statistical power, i.e. the ability of the impact evaluation to identify statistically significant differences between the intervention and control populations. This will be compounded at endline if a significant number of households, female respondents, and/or children are lost to follow-up. The varying sample sizes across villages is a concern but has been mitigated through the application of sampling weights.

57. **Intervention prior to baseline data collection.** GTNS's FFA voucher distribution component was implemented prior to data collection. As such, the data collected cannot be treated as if they are pure baseline data. There are several indicators (presented below) that were likely affected by this intervention, e.g. food consumption score and food expenditure share. Other indicators, such as some of the more fast-moving anthropometric measures and even the WEAI, may have been influenced in a positive direction as well. The implication: many of the project impact estimates that will be generated at endline, particularly for relevant and fast-moving indicators, will likely have been watered down considerably, thereby affecting the impact evaluation's ability to estimate GTNS's full impacts.

58. **Indicator data capture shortfalls**. The household survey instrument was considerably long, and efforts were undertaken during its development and the piloting and review process to cut it down. For example, given that data were to be captured on household dietary diversity to enable the computation of the Household Dietary Diversity Score (HDDS), a decision was taken not to include the Minimum Dietary Diversity Women (MDD-W) survey module. Questions focused on capturing data on other indicators were

[36] 17 households that we were not able to match with the anthropometric data and 8 duplicates are not included.

also simplified for this same reason. Moreover, several of the indicators presented in Annex 1 were deemed unsuitable for baseline data collection, e.g. because they depend on project activities having had been implemented. The footnotes in Annex 1 describe these deviations and the associated rationale.

59. There was also a shortfall on how data were captured for the food expenditure share indicator. Ideally, respondents should have been asked if their households had consumed the food items in question without purchasing them, e.g. consumed from the household's own production or received as a gift or in-kind. However, only data on food items that were directly purchased through either cash or on credit were captured. Hence, if a household was significantly dependent on food stores or was a recipient of food assistance, their food expenditure share could be low or even zero, despite having low levels of non-food expenditure. To address this shortfall, we offer complementary analysis comparing the intervention and control households vis-à-vis such non-food expenditure. The reasoning is similar to that which underpins the food expenditure share indicator: poorer households are likely to spend a higher proportion of their income on food items, as opposed to non-food items, simply because their overall income levels are low. Consequently, comparing households vis-à-vis their non-food expenditure is a viable complement to the food expenditure share indicator.

2.0 Evaluation Findings (Baseline Survey)

This section presents the results of GTNS's baseline survey. The results for 18 outcome indicators and 1 additional indicator for program exposure are each presented and reviewed individually.

2.1 Programme exposure

2.1.1 Proportion of households receiving food assistance

60. Given that the evaluation is concerned with the effect of direct nutrition and asset building at the household and community levels, it is key to assess the type and extent of participation in social programmes, both the one under evaluation and others. Even though the households in the control group, by definition, are not expected to participate in GTNS's interventions, it is important to verify this and assess if they are being exposed to other similar programmes implemented by the government or other organizations, particularly those which can influence food security and nutritional outcomes.

61. During the baseline survey households were asked specific questions pertaining to their exposure to programmes spearheaded by Government, community-based organizations (CBOs), and non-governmental organizations (NGOs). As is clear from Table 3, a very high percentage of households in the intervention villages reported having had benefited from external assistance (87%), against only 3% of households in the control villages. Moreover, out of those households that reported such exposure, 93% reported that they had received food assistance distributed by WFP. Put another way, 78% of households in the intervention villages reported having had been already been exposed to GTNS's FFA component, compared with less than 1% of households in the control villages. This is both good and bad from an impact evaluation design perspective. It is good because the impact evaluation design depends on a high percentage of households with both under-two children and pregnant women/under-1-year children in the intervention villages participating in GTNS's FFA and PHL components.[37] It is bad, however, because it will likely 'water down' GTNS's impact estimates, as explained in the limitations subsection above.

[37] That is, the ITT effect estimates that will be generated will be similar to the Average Treatment Effect (ATE), i.e. the effect of GTNS on those households, women, and children that participated in its FFA component.

Table 3: Proportions of Households Benefiting from External Assistance

Variable	Control (1) Mean	Intervention (2) Mean	Dif. (2-1)
HH benefiting from any form of assistance	0.034	0.873	0.839***
	(0.181)	(0.333)	(0.029)
Observations	**326**	**314**	**640**
If yes, what are the type of benefits accessed?			
Work for food	0.328	0.036	-0.292
	(0.498)	(0.187)	(0.178)
Food assistance from WFP	0.193	0.930	0.737***
	(0.418)	(0.256)	(0.102)
Food assistance (civil society/NGO/gov.)	0.000	0.051	0.051**
	(0.000)	(0.220)	(0.022)
Other sources	0.479	0.015	-0.464*
	(0.530)	(0.123)	(0.255)
Observations	**9**	**263**	**640**

* p<0.1, ** p<0.05, *** p<0.01; Standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in populations across intervention and comparison villages and observations are weighted using sample weight.

2.2 Household food security indicators

62. The quantity and quality of food consumed within a household is an important determinant of household food security and nutritional status. In this section, we explore baseline dietary information, adequacy of consumption of key macro and micronutrient foods, household food expenditure, livelihood coping strategies, and overall food security. This provides insight on the baseline food and nutritional security status of both the intervention and control households. We relied on WFP guidelines, specifically the Consolidated Approach to Reporting Indicators of Food Security (CARI) guidelines,[38] to assess and present standard indicators for food security. Disaggregating the data by sex of household head would have been important to assess the difference between female and headed households. However, the female headed sub-sample is only 36 (22 among intervention households and 14 among control households), which is not large enough to enable statistical analysis.

63. Food consumption is of particular interest in this evaluation because it serves as a pathway through which the asset building, post-harvest loss training, and direct nutrition support is expected to affect household and individual nutrition and food security outcomes. The community and household asset creation intervention, for example, may increase household income and the production of nutritious food, allowing households to consume a more diverse and nutritious diet. The FFA component of the programme emphasises on creating nutrition-sensitive community assets and gender and nutrition sensitive household assets to increase food availability and diversity in the long term. However, direct conditional food transfer is expected to increase households short term consumption of nutritious foods. Post-harvest loss technology and training is also expected to increase the availability, diversity, and consumption of nutritious foods. For the purpose of the evaluation, it is therefore useful to learn from the baseline data how diverse and adequate diets were across both intervention and control households.

2.2.1 Household Dietary Diversity Score (HDDS)

64. Obtaining detailed individual dietary intake data can be time consuming and expensive. The baseline survey instrument was considerably long. Thus, efforts were undertaken during its development and the

[38] WFP. (2015). Consolidated Approach to Reporting Indicators of Food Security (CARI). https://documents.wfp.org/stellent/groups/public/documents/manual_guide_proced/wfp271449.pdf?_ga=2.181892007.1834170838.1593242821-248164796.1592995842

piloting and review process to shorten it. In this context, it was decided to use the Household Dietary Diversity Score (HDDS), as opposed to the individual-based Minimum Dietary Diversity, Women (MDD-W), to capture dietary diversity data.

Table 4: Proportions of households consuming specific food groups over the past 7 days

		Intervention	
	Control (1)	(2)	Dif. (2-1)
Variable	Mean	Mean	(SE)
Consumed cereals and tubers	0.979	0.995	0.016*
	(0.145)	(0.071)	(0.009)
Consumed pulses	0.284	0.902	0.617***
	(0.452)	(0.298)	(0.048)
Consumed vitamin A-rich vegetables	0.094	0.103	0.009
	(0.293)	(0.304)	(0.030)
Consumed green leafy vegetables	0.333	0.273	-0.060
	(0.472)	(0.446)	(0.055)
Consumed other vegetables	0.366	0.324	-0.042
	(0.482)	(0.469)	(0.060)
Consumed vitamin-A rich fruits	0.000	0.026	0.026
	(0.000)	(0.159)	(0.016)
Consumed other fruits	0.064	0.117	0.054*
	(0.244)	(0.322)	(0.028)
Consumed meat	0.207	0.540	0.333***
	(0.406)	(0.499)	(0.052)
Consumed eggs	0.120	0.521	0.401***
	(0.326)	(0.500)	(0.047)
Consumed fish	0.028	0.052	0.024
	(0.165)	(0.222)	(0.028)
Consumed milk and dairy products	0.013	0.021	0.008
	(0.113)	(0.142)	(0.011)
Consumed oils and fats	0.539	0.899	0.359***
	(0.499)	(0.302)	(0.044)
Consumed sweets	0.138	0.173	0.034
	(0.346)	(0.379)	(0.042)
HDDS (out of 13)	3.166	4.945	1.779***
	(2.464)	(2.193)	(0.294)
Observations	**326**	**314**	**640**

* p<0.1, ** p<0.05, *** p<0.01; Standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in populations across intervention and comparison villages and observations are weighted using sample weight.

65. The HDDS is a proxy for the economic ability of a household to access a variety of foods.[39] Its administration involved collecting data on the household's consumption of 16 food items over the past 7 days prior to the survey, and then grouping these items in to the following categories:

- **Cereals and tubers:** e.g.: cereals, grains, roots and tubers Rice, pasta, bread, sorghum, millet, maize, fonio, potato, yam, cassava, white sweet potato
- **Vitamin A-rich vegetables:** e.g.: carrot, red pepper, pumpkin, orange sweet potatoes, etc.
- **Green leafy vegetables:** e.g.: spinach, broccoli, amaranth and / or other dark green leaves, cassava leaves, etc.
- **Other vegetables**: e.g.: spinach, onion, tomatoes, carrots, peppers, green beans, lettuce, etc.

39 Hoddinott, J. & Yohannes, Y. 2002. Dietary diversity as a food security indicator.
FANTA 2002, Washington DC. (available at: https://core.ac.uk/download/pdf/6289355.pdf)

- **Vitamin A-rich fruits:** e.g.: mango, papaya, apricot, peach, etc.
- **Other fruits:** e.g.: banana, apple, lemon, etc.
- **Meat:** flesh meat, organ meat and others etc.
- **Pulses:** e.g.: beans, cowpeas, peanuts, lentils, nut, soy, pigeon pea and / or other nuts etc.
- **Milk and dairy products**: e.g.: fresh milk / sour, yogurt, cheese, other dairy products
- **Fish:** e.g.: fish, including canned tuna, escargot, and / or other seafood etc.
- **Eggs:** eggs of different birds
- **Oils and fats:** e.g.: vegetable oil, palm oil, shea butter, margarine, other fats /oil
- **Sweets:** e.g.: sugar, honey, jam, cakes, candy, cookies, pastries, cakes and other sweet sugary drinks

66. Table 4 shows the results, i.e. the proportions of households that reported consuming the various food items seven days prior to the survey. There are noteworthy observations. First, the average number of items from the 13 food categories is considerably higher for intervention households—nearly five items compared with just under 3.2 items for the control households. Second, the vast majority of households (100% and 98% in the intervention and control villages, respectively) reported to have consumed cereals and tubers in the past seven days. This is not surprising, given that this group comprises food items form the primary staple food of the district—maize. Third, a large majority of households in the intervention villages (90%) also reported to have consumed pulses, as compared with only 28% in the control group. There are also large and statistically significant differences in favour of intervention households in relation to meat, egg, and oil/fat consumption. This is surprising, given that the former two items were not part of the food ration distributions. It is possible that households used part of their food expenditure savings to purchase these more desired food items. However, because pure baseline data were not collected (for reasons explained above), it is difficult to know for certain.

2.2.2 Food consumption score

67. The food consumption score (FCS) is a proxy for household food access and is used to classify households into different groups based on the adequacy of the foods consumed in the week prior to being surveyed. Here, the frequency of the consumption of each of the abovementioned 16 items in the past 7 days is taken into account. The FCS indicator focuses on three dimensions of food consumption: dietary diversity, food frequency, and relative nutritional importance. The score is calculated using the weighted frequency of consumption of nine food groups consumed by a household during the seven days before the survey. Higher (lower) weights are assigned to the best (worst) food groups in terms of their caloric density and macro and micro-nutrient content.

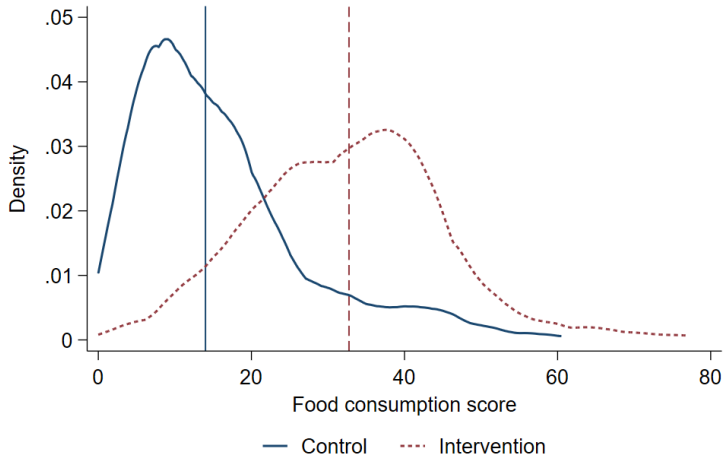


Figure 5: FCS distributions intervention for intervention and control villages
Note: The vertical lines indicate median values for the control and intervention groups

68. The weighted sum of frequency of household consumption is a continuous variable with a possible range of 0 to 112. Following the CARI guidelines, the food consumption scores were then grouped into three food consumption groups as Poor consumption (< 21), Borderline consumption (between 21 and 35), and Acceptable consumption (≥ 35).

69. Figure 5 presents distribution of the calculated baseline FCS with vertical line showing the median values for the intervention and control households. Households in the intervention villages are clearly better off in general than those of the control villages, with median values of 32.75 and 14, respectively. The fact that, as revealed above, most intervention households had benefited from GTNS's FFA component prior to data collection is likely a key reason for the differences in the two distributions.

70. The bar chart of Figure 6 illustrates the estimated proportion of households within the three food consumption groups. Mean values are presented across the control and intervention households, with error bars indicating a 95% confidence interval for each group. As is clear, a 76% of households in the control villages fall in the poor consumption category, while this is only 18% among households residing in the intervention villages.

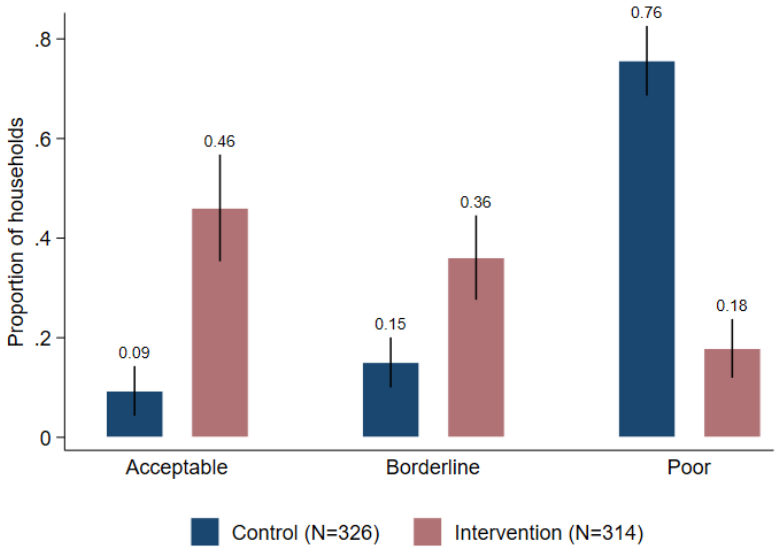


Figure 6: Food consumption adequacy by category groupings

71. The mean differences in the proportions of intervention and control households falling under each of the three food consumption groups are presented in Table 5. The results clearly show that the apparent differences between the two groups of households are highly statistically significant. The proportion of intervention households falling under the borderline and acceptable consumption groups is 21% and 37% higher, respectively. This is consistent with the results associated with the continuous FCS score.

Table 5: Proportions of households falling under the three food consumption categories

Variable	Control (1) Mean	Intervention (2) Mean	diff (2-1)
Acceptable	0.093	0.460	0.367***
	(0.291)	(0.499)	(0.060)
Borderline	0.150	0.361	0.210***
	(0.358)	(0.481)	(0.050)
Poor	0.756	0.179	-0.578***
	(0.430)	(0.384)	(0.046)
Observations	**326**	**314**	**640**

* p<0.1, ** p<0.05, *** p<0.01; standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in population across intervention and comparison villages

2.2.3 Food consumption score – Nutrition

72. The Food Consumption Score–Nutrition (FCS-N) is another indicator for household food security. It focuses on the nutritional adequacy of a household's diet. It uses the same data associated with the FCS and provides an additional level of information on the nutritional value of the foods consumed by the household one week prior to the baseline survey.

73. Based on the WFP module, the frequency of consumption of food items was aggregated into three nutrient rich food groups. Vitamin A rich foods include dairy, eggs, orange vegetables, and orange fruits. Protein rich foods include pulses, dairy, flesh meat, organ meat, and fish and eggs. Finally, Hem iron rich foods include flesh meat, organ meat, and fish.

74. Figure 7 presents box plots for the resulting FCS-N scores across the intervention and comparison households. It is clear that households in the intervention villages are better off vis-à-vis their consumption of vitamin A rich food and, to a greater extent, protein rich foods. However, very few households across both sets of villages consumed iron rich foods, during the week prior to being interviewed.

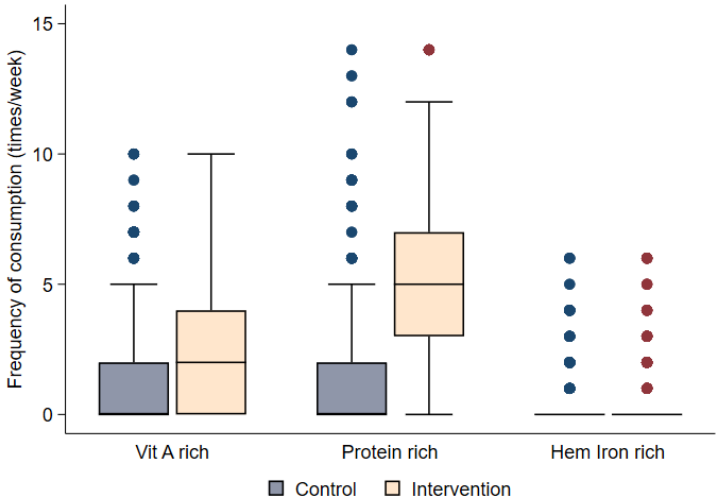


Figure 7: Box plots for frequency of consumption of nutrient rich food groups in past week

75. Following WFP's CARI module, households were categorized into three consumption frequency categories for each of the three nutrient rich food groups. These are zero times in the last 7 days (Never), 1 to 6 times in the last 7 days (sometimes), and every day (at least daily).

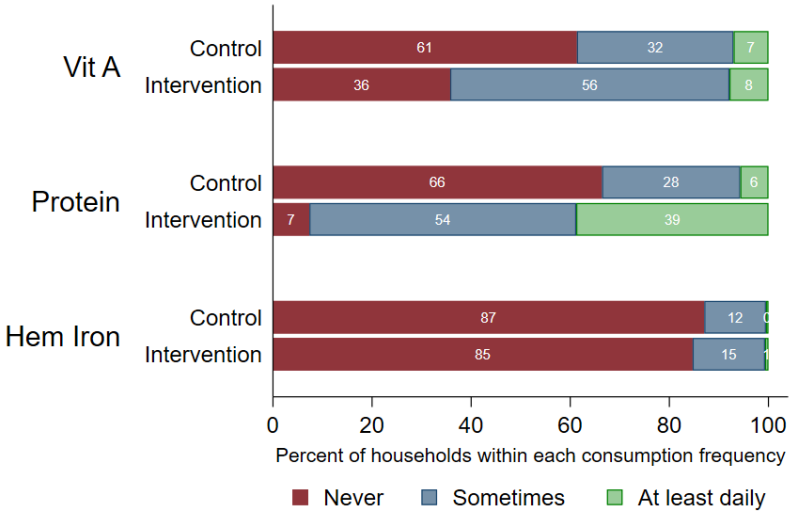


Figure 8: Percentages of households by three consumption frequency groupings

Note: Never = zero consumption; Sometimes = 1 to 6 times per week; At least daily = 7 times or more per week.

76. Figure 8 presents the percentages of households within the three consumption frequency groups of nutrient rich foods. The pattern is similar to the box plots of Figure 7. However, while households in the intervention villages are better off in relation to both Vitamin A and protein consumption, there is considerable room for improvement, as is the case for households in both groups with respect to iron rich foods.

77. The mean differences in consumption frequencies between intervention and control households across the three nutrition rich food groups are presented in Table 6. Again, we see that the differences across the household categories observed in the above for the vitamin A and protein food groups are highly statistically significant. The mean differences for iron rich foods, however, are not statistically significant. This pattern suggests, again, that the food assistance distributed prior to the baseline survey is likely one of the drivers of the observed differences between intervention and control households.

Table 6: Comparison of proportions of households in each nutrient rich food consumption grouping

Variable	Control (1) Mean	Intervention (2) Mean	Dif. (2-1)
Vitamin A rich foods			
Never	0.613	0.358	-0.256***
	(0.488)	(0.480)	(0.056)
Sometimes	0.316	0.564	0.247***
	(0.466)	(0.497)	(0.053)
At least daily	0.070	0.079	0.008
	(0.256)	(0.270)	(0.029)
Observations	**326**	**314**	**640**
Protein rich foods			
Never	0.664	0.073	-0.591***
	(0.473)	(0.261)	(0.045)
Sometimes	0.279	0.539	0.260***
	(0.449)	(0.499)	(0.059)
At least daily	0.057	0.388	0.331***
	(0.232)	(0.488)	(0.048)
Observations	**326**	**314**	**640**
Hem Iron rich foods			
Never	0.871	0.847	-0.024
	(0.336)	(0.361)	(0.045)
Sometimes	0.125	0.146	0.022
	(0.331)	(0.354)	(0.044)
At least daily	0.005	0.007	0.002
	(0.070)	(0.083)	(0.006)
Observations	**326**	**314**	**640**

* p<0.1, ** p<0.05, *** p<0.01; standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in population across intervention and comparison villages

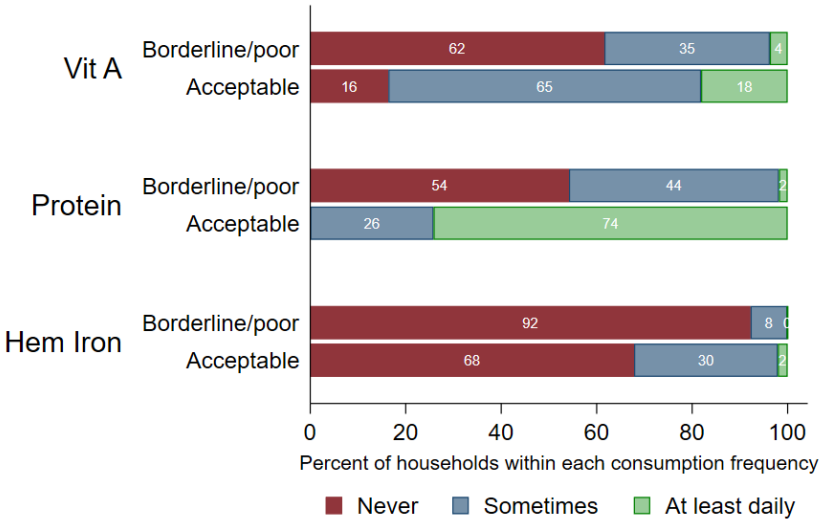


Figure 9: Percentage of households within the three consumption frequency groups of nutrition rich foods

2.2.4 Food Expenditure Share

78. Food expenditure share is an indicator of a household's vulnerability; poor households tend to spend a larger share of their income on food items. During the survey, respondents were asked how much they spent on various food items during the previous month, as well as non-food items (e.g. toothpaste, transport, and haircare products) that are regularly purchased. They were also asked about non-food items irregularly purchased (e.g. agricultural inputs, school and hospital fees, and mechanical equipment) over the previous six months. The latter were converted into monthly values in order to compute the proportion of total household expenditure spent on food.

79. It is usual practice to estimate the cash value of the food produced by the household or provided as a gift or food assistance, in addition to that which was purchased. However, this was not done during the baseline data collection effort. Consequently, households that may have consumed significant food from their own production or benefited from food assistance from WFP could be wrongly classified as being food secure or non-vulnerable households. Indeed, most households (80%) with zero food expenditure share hail from the intervention villages. This is to be expected, given that these households likely consumed the food obtained from WFP, which was not valued and thus excluded from the expenditure share calculation. To address this issue, results for the food expenditure share indicator are complemented with analysis and interpretation of the non-food expenditure data that were collected.

80. Figure 10 presents box plots revealing the distribution of food expenditure share across the intervention and control households. Clearly, the households with zero expenditure share, which are primarily in the intervention group, have skewed distributions.

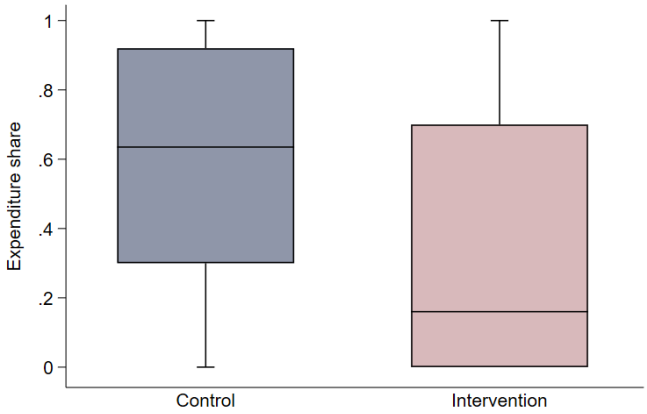


Figure 10: Box plots for food expenditure share (proportion)

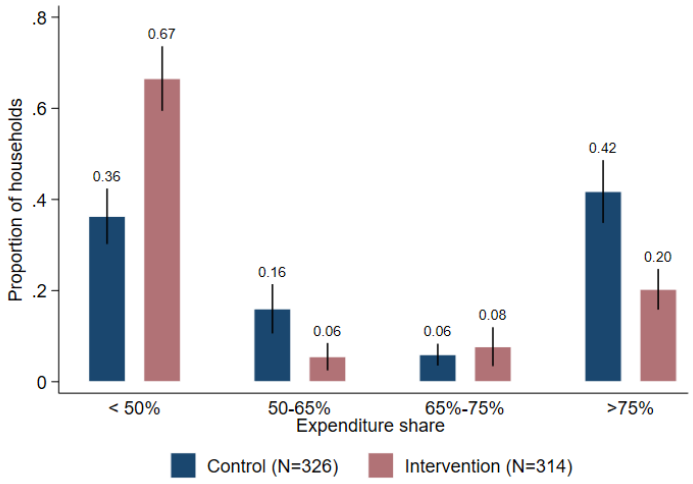


Figure 11: Proportion of households by food expenditure share category

81. Households were categorized into four expenditure share categories: those spending more than 75% or more; 65% to 74.9%; 50-64.9% and less than 50% of their total income on food, as per WFP's CARI module. The results are presented in Figure 11. As is the case for the box plots, food expenditure share is considerably greater among households in the control villages.

82. The mean differences in proportions of households falling under each food expenditure share category are presented in Table 7, revealing that the observed differences in Figure 10 and Figure 11 are highly statistically significant.

Table 7: Proportion comparison of households by expenditure share category

Food expenditure share	Control (1) Mean	Intervention (2) Mean	diff (2-1)
< 50%	0.363	0.665	0.302***
	(0.482)	(0.473)	(0.047)
50-65%	0.160	0.055	-0.105***
	(0.367)	(0.228)	(0.031)
65%-75%	0.059	0.077	0.017
	(0.237)	(0.267)	(0.025)
>75%	0.417	0.203	-0.215***
	(0.494)	(0.403)	(0.041)
Observations	**326**	**314**	**640**

* p<0.1, ** p<0.05, *** p<0.01; standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in population across intervention and comparison villages

83. As explained above, a significant reason why the food expenditure share is likely significantly greater among households in the control villages is because most households in the intervention villages benefited from WFP food assistance and, therefore, spent less on food, either on a cash or credit bases. Hence, concluding that households were less vulnerable in the intervention villages prior to GTNS's implementation is likely to be misleading. We therefore complement the above analysis by examining non-food expenditure, calculated on a monthly basis per capita. Figure 12 presents box plots for the intervention and control households, while Table 9 compares the average values. While the box plots reveal slightly higher non-food expenditure among intervention households, Table 9 reveals that these differences are not statistically significant. This is also the case after the values are placed on a log rhythmic scale to mitigate the influence of outliers. We can conclude from this that that the intervention and comparison populations were at generally similar poverty levels at baseline.

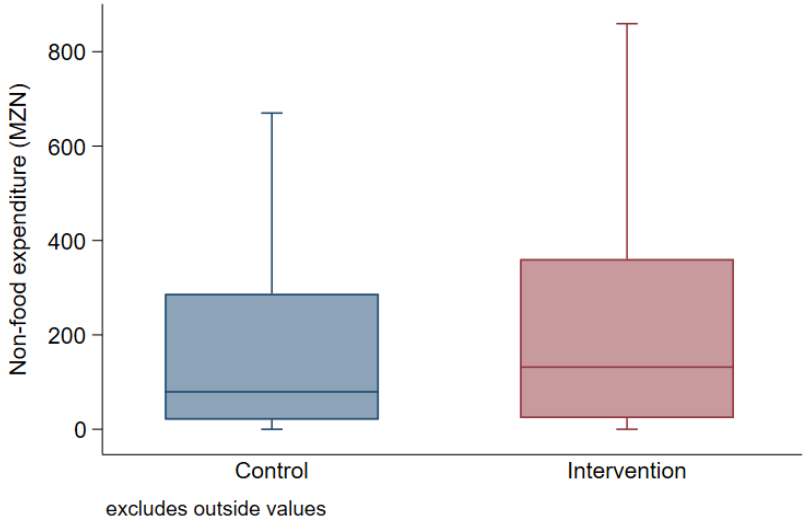


Figure 12: Box plots for non-food expenditure per month per capita

Table 8: Mean comparison of household non-food expenditure per capita

Variable	Control (1) Mean	Intervention (2) Mean	Dif. (2-1)
Monthly HH non-food consumption expenditure (MZN)	250.613	274.633	24.020
	(373.456)	(368.514)	(36.730)
Monthly HH non-food consumption expenditure (MZN)- logarithmic scale	4.757	5.007	0.251
	(0.367)	(0.228)	(0.031)
Observations	**326**	**314**	**640**

* p<0.1, ** p<0.05, *** p<0.01; standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in population across intervention and comparison villages

2.2.5 Livelihood Coping Strategies

84. The Livelihood Coping Strategies (LCS) indicator is constructed from a series of questions regarding the household's experience with livelihood stress and asset depletion during the previous 30 days prior to the baseline survey. Following WFP's CARI module, the specific livelihood coping strategies reported by the household were categorized into three broad groups: stress, crisis, and emergency strategies. There are 10 core indicators, which can be replaced with others from the master list depending on the context. Data were captured on all 17 possible coping strategies. These are presented by category in Table 9, which compares the differences between intervention and control households for each strategy. The LCS indicator is constructed from 10 core strategies that are in italics, which can be adaptable depending on the context. These appear appropriate for the Chemba context and comprise four stress strategies, three crisis strategies, and three emergency strategies.

85. Stress strategies indicate a reduced ability of the household to deal with future shocks due to asset depletion or increased indebtedness. The strategies adopted by the household can included borrowing money or spending savings. Crisis strategies are strategies that directly reduce future productivity, including human capital formation, such as the selling of productive assets. Emergency strategies can affect future productivity and can be more difficult to recover from, such as the selling one's land.

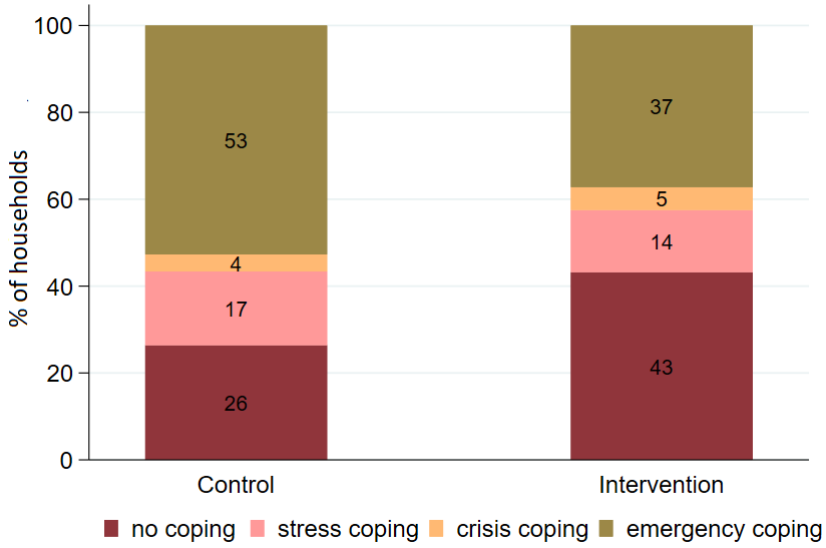


Figure 13: Households adopting livelihood coping strategies by category

86. Figure 13 displays the proportions of intervention and control households across the four coping strategy categories. A household falls under a particular category depending on the highest severity of the coping strategies they had adopted. For example, if a household adopted three stress coping strategies and one emergency strategy, they automatically fall under the latter category. The first key observation from Figure 13 is that fewer households in the intervention villages found it necessary to pursue one or more coping strategy of any kind during 30 days prior to being interviewed. Specifically, 43% of households in the intervention villages did not do so, against 26% among their counterparts in the control villages. Table 9 reveals that this difference is highly statistically significant. High proportions of households in both the control villages (53%) and intervention villages (37%) pursued one or more emergency strategy, indicating high levels of vulnerability. Table 10 reveals that the difference between the two groups of households is highly statistically significant, while Table 9 reveals that the most common emergency strategy in both sets of villages was begging.

Table 9: Mean difference in proportion of HH adopting each coping strategies

Coping strategies adopted	Control (1) Mean	Intervention (2) Mean	Dif. (2-1)
Stress coping strategies			
Sold household assets	0.110	0.110	-0.000
	(0.314)	(0.313)	(0.037)
Spent savings	0.282	0.188	-0.094**
	(0.451)	(0.392)	(0.043)
Sold more animals (non-productive) than usual	0.149	0.216	0.066
	(0.357)	(0.412)	(0.046)
Borrowed money	0.341	0.177	-0.164***
	(0.475)	(0.382)	(0.045)
Sent household member to eat elsewhere	0.185	0.219	0.034
	(0.389)	(0.414)	(0.040)
Purchased food on credit or borrowed food	0.313	0.108	-0.204***
	(0.464)	(0.311)	(0.040)
Moved children to less expensive school	0.019	0.009	-0.010
	(0.137)	(0.094)	(0.010)
Crisis coping strategies			
Sold productive asset or means of transport	0.022	0.021	-0.001
	(0.148)	(0.144)	(0.018)
Withdrew children from school	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Reduced essential non-food expenditure	0.080	0.067	-0.013
	(0.272)	(0.251)	(0.029)
Harvested immature crops	0.490	0.340	-0.150***
	(0.501)	(0.474)	(0.051)
Consumed seed stocks	0.482	0.324	-0.158***
	-0.5	(0.469)	(0.054)
Decreased expenditures on agri. Inputs	0.031	0.057	0.026
	(0.175)	(0.233)	(0.021)
Emergency coping strategies			
Sold house or land	0.019	0.006	-0.013
	(0.135)	(0.075)	(0.009)
Begged	0.436	0.296	-0.140**
	(0.497)	(0.457)	(0.053)
Engaged in illegal income activities	0.008	0.004	-0.004
	(0.089)	(0.065)	(0.006)
Sold last female animals	0.136	0.079	-0.057**
	(0.343)	(0.270)	(0.027)
Entire or big part of household migrated	0.016	0.035	0.018
	(0.126)	(0.183)	(0.017)
Observations	**326**	**314**	**640**

* p<0.1, ** p<0.05, *** p<0.01; standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in population across intervention and comparison villages

Table 10: Mean difference in proportion of households adopting different livelihood coping strategies, as well as the resulting Livelihoods Coping Strategies Index (LCSI)

Variable	Control (1) Mean	Intervention (2) Mean	Dif. (2-1)
None undertaken	0.264	0.432	0.168***
	(0.441)	(0.496)	(0.056)
Stress category	0.170	0.143	-0.026
	(0.376)	(0.351)	(0.038)
Crisis category	0.039	0.053	0.013
	(0.195)	(0.224)	(0.023)
Emergency category	0.527	0.372	-0.155***
	(0.500)	(0.484)	(0.050)
Total weighted LCSI (10 core strategies; out of 29 points)	4.660	3.705	-0.955**
	(4.262)	(4.310)	(0.475)
Observations	**326**	**314**	**640**

* p<0.1, ** p<0.05, *** p<0.01; standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in population across intervention and comparison villages

87. To complement the four categories of coping strategies, the total weighted Livelihood Coping Strategy Index (LCSI) was computed for both the intervention and control households. This involved assigning a severity weight to each of the ten core coping strategies adopted by the household. Accordingly, each stress strategy received a severity weight of 2, with weights of 3 and 4 for the crisis and emergency categories, respectively. The box plots of Figure 14 shows that the median value of the LCSI is significantly larger for households in the control villages compared to those in the intervention villages. The mean differences in Table 10 are also highly statistically significant, revealing that households in the control villages were more likely to engage in more severe coping strategies in the 30-day period prior to data collection.

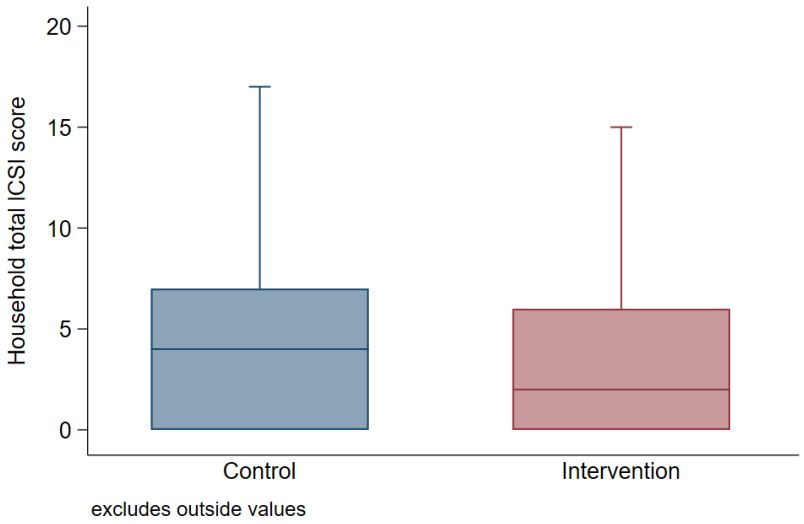


Figure 14: Box Plots for the weighted Livelihoods Coping Strategies Index (LCSI)

2.2.6 Reduced Coping Strategies Index (rCSI)

88. The rCSI narrows in more specifically on food related coping strategies, and therefore complements the LCSI. It is based on a universal list of five coping strategies and a common set of severity weights. During the survey, household respondents were asked how many times during the last seven days they relied on each of the five strategies, as shown in Table 11.

Table 11: Mean difference in frequency of food consumption-based coping strategies adopted and resulting reduced Coping Strategy Index (rCSI) across the group

Variable	Control (1) Mean	Intervention (2) Mean	diff (2-1)
Rely on less preferred and less expensive food (weight = 1)	2.813 (2.304)	1.642 (1.967)	-1.172*** (0.211)
Borrow food or rely on help from a relative or friend (weight = 2)	1.322 (1.534)	0.676 (1.074)	-0.646*** (0.116)
Limit portion size of meals at mealtimes (weight = 1)	2.821 (2.253)	1.391 (1.616)	-1.429*** (0.169)
Restrict consumption by adults for small children to eat (weight = 3)	2.198 (1.877)	1.097 (1.347)	-1.101*** (0.161)
Reduce number of meals eaten in a day (weight = 1)	3.013 (2.225)	1.737 (2.035)	-1.277*** (0.207)
Total households score for rCSI (out of a maximum of 56 points)	17.885 (11.394)	9.414 (8.846)	-8.471*** (0.905)
Observations	**326**	**314**	**640**

* p<0.1, ** p<0.05, *** p<0.01; standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in population across intervention and comparison villages

89. The box plots presented in Figure 15 reveal that households in the control villages were more likely to resort to undertaking both more and more severe consumption-based coping strategies than the intervention households. Table 2 also reveals the mean difference for the overall rCSI is statistically significant. However, households in the control villages are much more likely to be food insecure, as compared to households in the intervention villages.

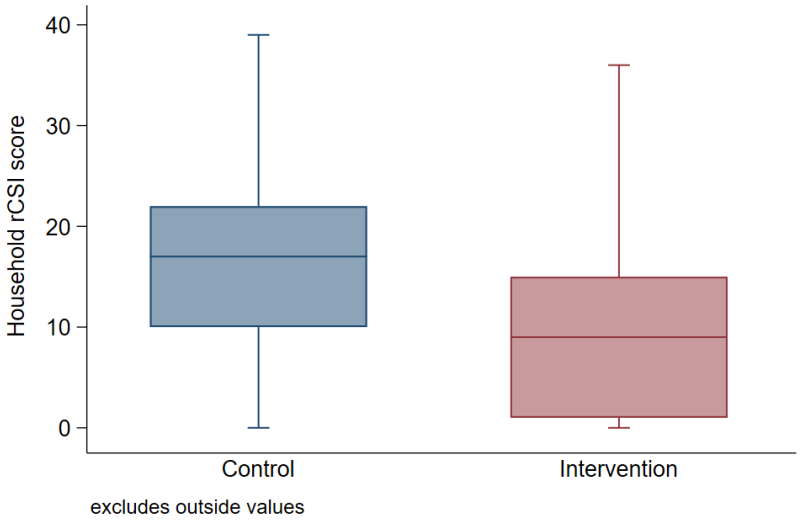


Figure 15: Box Plots for the reduced Coping Strategies Index (rCSI)

2.2.7 Food Security Index

90. The Food Security Index (FSI) represents a household's overall food security status. It is constructed by combining food security indicators into a composite indicator based on WFP's CARI console. It is a composite indicator of the food consumption score and coping capacity represented by maximum coping behaviour and food expenditure share. Specifically, the four-point FSI is calculated first by aggregating the averages of

the above coping strategies and expenditure share categories. This value is then combined with household food consumption by averaging the two. The value is rounded off, which groups households into four discrete categories: 1) Food secure; 2) Marginally food secure; 3) Moderately insecure; and 4) Severely insecure.

91. The baseline results for this compositive measure is presented as pie charts in Figure 16. Large differences between households residing in the intervention and control households are clearly visible. For instance, 32% of households in the control villages are classified as severely food insecure, while this is only 8% in the intervention villages. Conversely, 21% of households in the intervention villages are food secure, while this statistic is only 2% in the control villages. These differences are highly statistically significant, as shown in Table 12.

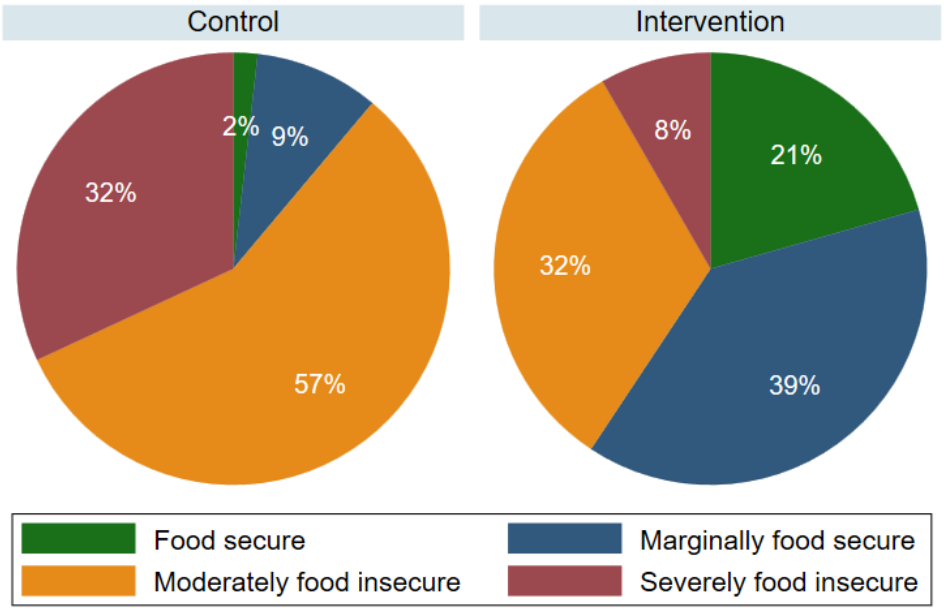


Figure 16: Overall household food security across the treatment and control group

Table 12: Mean differences in the proportions of households falling under the food security index levels

Variable	Control (1) Mean	Intervention (2) Mean	Dif. (2-1)
Food secure	0.018	0.206	0.188***
	(0.133)	(0.405)	(0.032)
Marginally food secure	0.093	0.387	0.294***
	(0.291)	(0.488)	(0.037)
Moderately food insecure	0.570	0.324	-0.246***
	(0.496)	(0.469)	(0.044)
Severely food insecure	0.319	0.083	-0.236***
	(0.467)	(0.276)	(0.040)
Observations	**326**	**314**	**640**

* p<0.1, ** p<0.05, *** p<0.01; standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in population across intervention and control villages

2.3 Post-harvest Loss

92. According to FAO, post-harvest losses (PHL) are crop losses that occur from the site of immediate growth (harvest) to the moment it reaches the consumer.[40] The loss could be due to either on-farm factors, such as improper harvesting, and/or off-farm factors, such as lack of access to road or appropriate means of transportation.

93. GTNS's baseline survey captured information on household crop production, yield, and the respondents' assessment of post-harvest losses. Among those households that reported farming in the previous agricultural season, respondents were asked to provide their assessment of post-harvest losses due to on-farm factors and off-farm factors. The PHL indicator is calculated as a percentage post-harvest losses vis-a-vis total harvest in kilograms (kg).

94. The average harvest per household is 379 kgs and 275 kgs for the intervention and control households, respectively. Table 13 displays the baseline PHL results for the intervention and control groups. The estimated PHL is 26% for the control households and 31% for the intervention households, and this difference is statistically insignificant. The estimated values are within the range of the national post-harvest losses, which are estimated to be over 30%.[41] Approximately, 55% of households in the control group and 59% from the intervention group reported post-harvest losses due to on-farm factors, while about 5% of households in both the control and intervention groups reported losses due to off-farm factors.

Table 13: Proportions of households reporting on-farm and off-farm loss factors and PHL

Variable	Control (1) Mean	Intervention (2) Mean	Dif. (2-1)
Post-harvest loss factors			
Any loss on crops grown due to on-farm factors	0.545	0.591	0.046
	(0.499)	(0.493)	(0.057)
Any loss on crops grown due to off-farm factors	0.045	0.052	0.007
	(0.208)	(0.222)	(0.028)
Post-harvest loss (average proportion lost)	0.262	0.313	0.051
	(0.355)	(0.390)	(0.045)
Observations	**285**	**279**	**564**

* p<0.1, ** p<0.05, *** p<0.01; standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in population across intervention and comparison villages

2.4 Women's Empowerment

95. Both as an intrinsically important impact and as a means of promoting improved food and nutritional security, GTNS is seeking to empower both women and adolescent girls. In this section, baseline results are presented on three indicators on women's participation in household decision-making and the Women's Empowerment in Agriculture Index (WEAI).

2.4.1 Women's participating in household decision-making

96. The ability to make choices is an important dimension of women's empowerment and socio-cultural status. Agency or empowerment is defined as the ability to define one's own goals and act upon them even

[40] http://www.fao.org/fsnforum/resources/fsn-resources/guidelines-how-measure-harvest-and-post-harvest-losses
[41] https://www.fanrpan.org/sites/default/files/publications/Mozambique_PHM_Policy_Brief.pdf

in the face of opposition from others.[42] The baseline status for indicators pertaining to women's reported involvement in decisions, as well as control and agency, are summarized in Table 14. Women were first asked who usually decides whether they can go to a hospital or seek health services. Almost all women (approximately 95%) in both intervention and comparison villages reported that it is they who decide. They were further asked who in their households decide whether they can visit family or other relatives. Only 28% expressed that such decisions were made in their respective households. However, among those for which this question was relevant, about 90% reported it is they, themselves, who decide. While not as positive, the situation is similar with respect to decisions on the use of agricultural produce and income from farm and off-farm sources. Less than 20% of women in both the intervention and comparison villages reported that it is only men in their respective households that decide. According to these three indicators, most women in both the intervention and comparison villages appear to be significantly empowered.

Table 14: Mean difference in women's decision-making power on health service access

Variable	Control (1) Mean	Intervention (2) Mean	Dif. (2-1)
Who decides on whether you go to the hospital or to access healthcare series?			
Spouse or other household members	0.301	0.415	0.114**
	(0.459)	(0.493)	(0.045)
Woman respondent herself	0.699	0.585	-0.114**
	(0.459)	(0.493)	(0.045)
Observation	**326**	**314**	**640**
Who usually decides whether you can go to visit family or relatives?			
Spouse or other household members	0.066	0.101	0.034
	(0.251)	(0.303)	(0.054)
Woman respondent herself	0.934	0.899	-0.034
	(0.251)	(0.303)	(0.054)
Observation	**76**	**105**	**181**
Who decides how to use the outputs for agricultural production and income from farm and off farm sources?			
Women have some input in decision making	0.711	0.759	0.048
	(0.454)	(0.428)	(0.050)
Only men decide	0.148	0.167	0.019
	(0.356)	(0.373)	(0.035)
Observations	**326**	**314**	**640**

* p<0.1, ** p<0.05, *** p<0.01; standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in population across intervention and comparison villages

2.4.2 Women's Empowerment in Agriculture Index (Pro-WEAI)

97. Baseline data were also collected on an abridged version of the Pro-WEAI.[43] It comprises 10 indicators,[44] which fall under three domains of agency: intrinsic agency (power within), instrumental agency (power to), and collective agency (power with). Each of the 10 binary indicators (Figure 15) were equally weighted. Consistent with the index's construction, a woman is considered empowered if she is scores positively on three or more of the ten indicators. Consequently, she is given a score of 1 when this threshold is reached on this index that ranges from 0 to 1. Other women who do not meet this cut-off and score positively on at least one of the weighted indicators, are allocated a weighted index score.

[42] Kabeer, N. (1999). Resources, agency, achievements: Reflections on the measurement of women's empowerment. Development and Change, 30(3), 435–464. https://doi.org/10.1111/1467-7660.00125.

[43] Malapit et al. (2019) Development of the project-level Women's Empowerment in Agriculture Index (pro-WEAI), World Development, https://doi.org/10.1016/j.worlddev.2019.06.018.

[44] The original Pro-WEAI has 12 indicators equally weighted. We have used ten indicators to construct the index because two indicators under the collective agency were not captured in the baseline survey.

98. Figure 17 presents a stacked bar graph vis-à-vis the resulting index. It displays both the average WEAI scores for women in the intervention and comparison villages, as well as the weighted contribution of each of the 10 indicators. According to this index, women in the intervention villages appear more empowered, as compared with their counterparts in the control villages. This is largely driven by their relatively higher average scores on three indicators: input in productive decisions, ownership of land and other assets, and access to and decisions on credit. Table 15 reveals differences between the intervention and control villages for each separate binary indicator which makes up the abridged Pro-WEAI, as well as the overall index. It is interesting to note that more women in the control villages reported that they have greater autonomy over income. However, for the overall index, the difference between the two groups is not statistically significant.

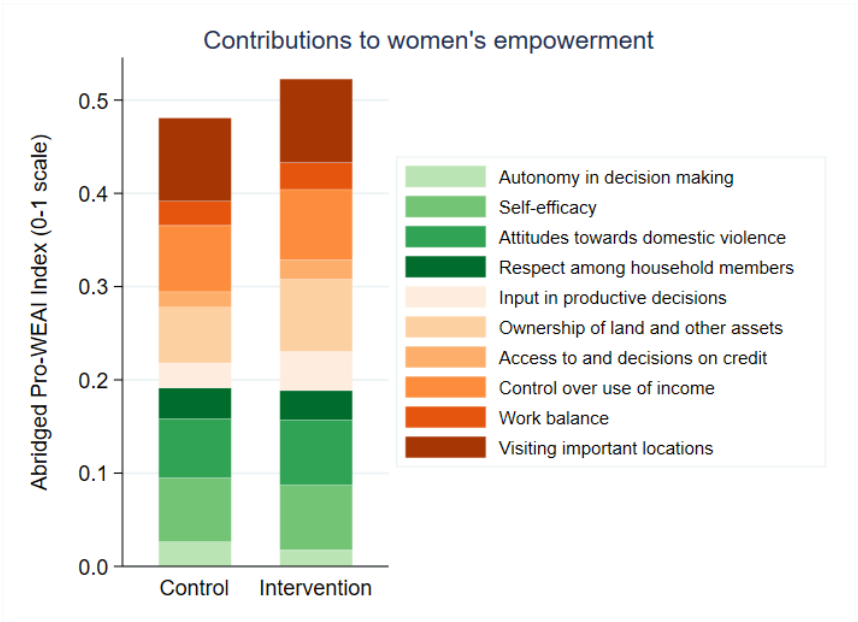


Figure 17: Pro-WEAI index and relative indicator index contribution

Table 15: Mean difference in proportion women achieving adequacy in Pro-WEA indicators & overall Index

Pro-WEAI indicators	Control (1)	Intervention (2)	Dif. (2-1)
Autonomy in income	0.262	0.176	-0.086**
	(0.441)	(0.382)	(0.042)
Self-efficacy	0.695	0.697	0.002
	(0.461)	(0.460)	(0.047)
Attitudes about domestic violence	0.688	0.747	0.058
	(0.464)	(0.435)	(0.052)
Input in productive decisions	0.266	0.418	0.152***
	(0.443)	(0.494)	(0.046)
Ownership of land and other assets[45]	0.606	0.780	0.174***
	(0.489)	(0.415)	(0.049)
Access to and decisions on credit	0.174	0.209	0.035
	(0.379)	(0.407)	(0.043)
Control over use of income	0.715	0.755	0.040
	(0.452)	(0.431)	(0.050)
Work balance	0.260	0.289	0.029
	(0.439)	(0.454)	(0.041)
Visiting important locations	0.993	0.962	-0.031**
	(0.085)	(0.192)	(0.014)
Respect among household members	0.346	0.320	-0.026
	(0.476)	(0.467)	(0.048)
Pro-WEAI empowerment index (overall) (0 to 1 scale)	0.481	0.523	0.042
	(0.000)	(0.000)	(0.000)
Observations	**326**	**314**	**640**

* p<0.1, ** p<0.05, *** p<0.01; standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in population across intervention and comparison villages

2.5 Health Attitudes and Service Access

2.5.1 4+ antennal care visits

99. Antenatal care (ANC) can play an important role in infant, child, and women's health through the provision of information on healthy pregnancy, screening for risk factors, and by providing health inputs for mothers and babies. The World Health Organization (WHO) recommends a minimum of four antenatal sessions with a trained health worker.[46] During the baseline survey, women were asked to describe their experiences with antenatal care services with reference to the under-2 child for whom anthropometric measurements were taken.

100. As indicated in Table 16, approximately 83% and 77% of women from the control and intervention villages reported remembering the number of prenatal appointments made. Conditional on attending, the mean number of sessions attended was five visits, with no statistically significant difference between the two groups of women. The percentage of women that attended at least four antenatal session is 71% for the control villages and 73% for the intervention villages, and this difference is statistically insignificant.

45 Other assets include large and small livestock, poultry and other animals, fish and fishing equipment, mechanized and non-mechanized farm equipment, non-farm business equipment, house and building, large and small consumer durables, cell phone, land not used for agricultural purpose and transportation means.

[46] https://www.who.int/gho/urban_health/services/antenatal_care_text/en/

Table 16: The mean difference in estimated number of antenatal care visits made and number of women's that have made at least 4 care visits during the last pregnancy

Variable	Control (1) Mean	Intervention (2) Mean	Dif. (2-1)
Women that remember number of prenatal appointments they have made	0.831	0.766	-0.065*
	(0.375)	(0.424)	(0.039)
Estimated number of antenatal care visits during the last pregnancy	4.984	4.973	-0.011
	(2.038)	(2.187)	(0.253)
Proportion of women that have made at least four antenatal care visits	0.716	0.728	0.012
	(0.452)	(0.446)	(0.053)
Observations	**326**	**314**	**640**

* p<0.1, ** p<0.05, *** p<0.01; standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in population across intervention and comparison villages

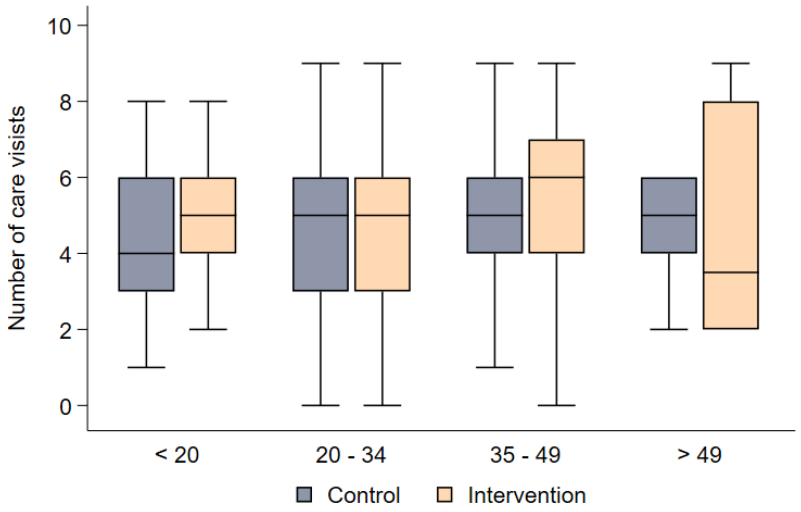


Figure 18: Number of care visits during the last pregnancy disaggregated by mother's age and intervention and control villages

101. Figure 18 shows distributions for the number of antenatal care visits disaggregated by women's age across the intervention and control villages. The result indicates the median antenatal care sessions attended by women of all age categories is over four times for both intervention and control groups. The exception to this is women from intervention group older than 49, which have a positively skewed distribution with a large proportion of women in this group attending less than four times.

2.5.2 Favourable attitude towards the recommended practices

102. GTNS's SBCC component intends to increase women's and adolescent girl's empowerment related to early marriage, sexual and reproductive health, and health seeking behaviours for basic child illness. The baseline survey asked women respondents questions pertaining to their attitudes towards recommended practices. These included those related to child breathing difficulties and use of contraceptives. The results are summarized in Table 17, while Annex 7 presents results for each specific practice. As indicated in Table 17, only 11% and 6% of the respondents agreed categorically to all three recommended practices in the control and intervention villages, respectively. That said, there is variation in responses across the practices.

Most respondents in both groups agreed that it was important to seek medical advice when a child experiences breathing difficulties. Fostering improved attitudes towards contraceptive use is therefore an area for significant improvement, as revealed in Annex 7.

Table 17: Mean difference in proportion of women with favorable attitude to recommended practices

Variable	Control (1) Mean	Intervention (2) Mean	Dif. (2-1)
Favourable attitude towards recommended practices			
(Agree to the 3 recommended practices)	0.114	0.062	-0.051*
	(0.318)	(0.242)	(0.029)
Observations	**326**	**314**	**640**

* p<0.1, ** p<0.05, *** p<0.01; standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in population across intervention and comparison villages

2.5.3 Attitudes towards early marriage

103. Respondents were also asked the extent to which they agree that marriage prior the age of 18 years brings negative consequences for girls. As indicated in Table 18, 33% and 26% of respondents in the control and intervention villages agreed categorically with this statement, while over one-third in both groups expressed that they did not know if this was the case. There are clearly opportunities for GTNS to improved attitudes and perceptions towards early marriage.

Table 18: Mean difference proportion of women with varying attitudes towards early marriage

Variable	Control[1] Mean (SE)	Intervention[2] Mean (SE)	diff (2-1) (SE)
Getting married before 18 years brings negative consequences for girls?			
Agree	0.326	0.264	-0.062
	(0.470)	(0.442)	(0.048)
Partially agree	0.112	0.078	-0.034
	(0.316)	(0.269)	(0.030)
Disagree	0.187	0.242	0.055
	(0.390)	(0.429)	(0.040)
I don't know	0.375	0.416	0.041
	(0.485)	(0.494)	(0.043)
Observations	**326**	**314**	**640**

* p<0.1, ** p<0.05, *** p<0.01; standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in population across intervention and comparison villages

2.5.4 Assisted Delivery at a Health Facility

104. The baseline survey collected information on the location where the 6-23-month child from which anthropometric measurements were taken was born. The results are presented in Table 19. Over 80% were reported as having had been born at a health facility in both the intervention and control villages. The small difference in favour of the control group is statistically insignificant.

Table 19: Mean difference in proportion of women that delivered at heath facility or at home

Variable	Control (1) Mean	Intervention (2) Mean	Dif. (2-1)
Assisted delivery at a health facility	0.841	0.819	-0.021
	(0.366)	(0.385)	(0.042)
Delivery at home or on the way to health facility	0.159	0.181	0.021
	(0.366)	(0.385)	(0.042)
Observations	**326**	**314**	**640**

* p<0.1, ** p<0.05, *** p<0.01; standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in population across intervention and comparison villages

2.5.5 Health seeking behaviour

105. Finally, the baseline survey captured information on women's health seeking behaviour for child illness. Table 20 shows that a large majority of women (89%) in both the intervention and control villages reported that when their child has a fever or cough, they seek advice or medical treatment.

Table 20: Mean difference in proportion of women with health seeking behaviour

Variable	Control (1) Mean	Intervention (2) Mean	Dif. (2-1)
When a child had fever or cough, did you seek advice or medical treatment?	0.892	0.887	-0.006
	(0.310)	(0.317)	(0.039)
Observations	**326**	**314**	**640**

* p<0.1, ** p<0.05, *** p<0.01; standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in population across intervention and comparison villages

2.6 Child Health and Nutritional Status

106. In this section we present baseline data for illness prevalence, dietary diversity, and nutritional adequacy among the sampled children aged 6-23 months across the control and intervention villages.

2.6.1 Prevalence of Child Illness

107. The caregivers were asked whether these children had suffered from any illnesses two weeks prior to the survey and, if so, the type of illness. Table 21 presents the results. Fever and malaria were the most commonly reported, at 50% and 46% in the control and intervention villages, respectively. This is followed by diarrhoea and ARI/cough. Less than one third of respondents in both the intervention and control villages reported that the children had been illness free two weeks prior to the baseline survey.

2.6.2 Dietary Diversity (6-23-month-old children)

108. The age range for dietary diversity and nutritional adequacy analysis among the children is restricted to six months or older, given that six months is the age at which a child's introduction to supplementary feeding is recommended. Children younger than 6 months are to be exclusively breastfed as recommended by WHO.[47]

[47] https://www.who.int/maternal_child_adolescent/documents/9789241596664/en/

Table 21: prevalence of disease in children aged 6-23 months

Variable	Control (1) Mean	Intervention (2) Mean	Dif. (2-1)
Fever / malaria	0.501	0.464	-0.037
	(0.501)	(0.499)	(0.047)
Measles	0.000	0.001	0.001
	(0.000)	(0.034)	(0.001)
Diarrhoea	0.248	0.188	-0.060
	(0.433)	(0.391)	(0.053)
ARI / cough	0.245	0.262	0.018
	(0.431)	(0.441)	(0.048)
Skin diseases	0.062	0.080	0.018
	(0.241)	(0.272)	(0.020)
Eye disease	0.007	0.023	0.016
	(0.082)	(0.151)	(0.012)
Other	0.050	0.047	-0.003
	(0.218)	(0.212)	(0.024)
No illness	0.264	0.319	0.055
	(0.441)	(0.467)	(0.056)
Observations	**341**	**339**	**680**

* p<0.1, ** p<0.05, *** p<0.01; standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in population across intervention and comparison villages

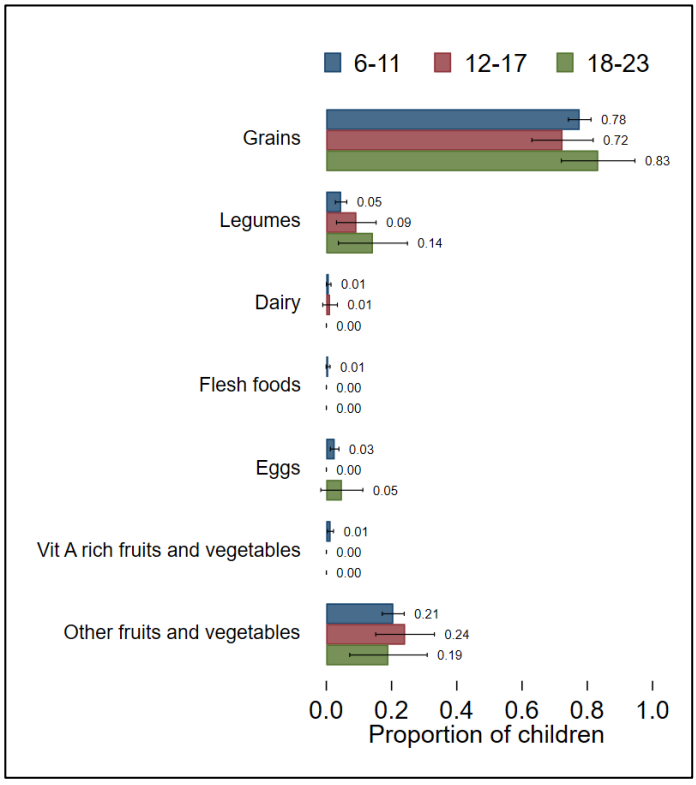


Figure 19: Food consumed during previous day for children aged 6-23 months by age category

Table 22: Baseline means of dietary diversity outcomes the previous day for children aged 6-23 months

Variable	Control (1) Mean	Intervention (2) Mean	Dif. (2-1)
Consumed grains, roots and tubers	0.753	0.792	0.040
	(0.432)	(0.406)	(0.052)
Consumed legumes and nuts	0.055	0.070	0.015
	(0.228)	(0.255)	(0.024)
Consumed dairy products	0.008	0.004	-0.004
	(0.090)	(0.062)	(0.008)
Consumed flesh foods	0.008	0.000	-0.008*
	(0.089)	(0.000)	(0.005)
Consumed eggs	0.009	0.034	0.025*
	(0.095)	(0.181)	(0.013)
Consumed Vitamin A rich fruits and vegetables	0.003	0.018	0.016*
	(0.054)	(0.135)	(0.008)
Consumed other fruits and vegetables	0.217	0.188	-0.029
	(0.413)	(0.391)	(0.044)
Number of groups (of 7)	1.817	1.884	0.067
	(0.498)	(0.558)	(0.052)
Observations	**341**	**339**	**680**

* p<0.1, ** p<0.05, *** p<0.01; standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in population across intervention and comparison villages

109. Figure 19 presents the percentages of food items consumed by children aged 6-23 months during the day preceding the survey, disaggregated by age category. Clearly, food made from grain, roots, and tubers was the most common food item consumed (78%, 72% and 83% for children aged 6-11, 12-17 and 18-23, respectively). Food from the fruits and vegetables category is a distance second followed by legumes. Table 22 compares the consumption of each item across the intervention and control villages, as well as the total number of items consumed. There results for both groups are quite similar. Overall, dietary diversity appears to be poor among children aged 6-23 months in both the intervention and control villages. The low level of diet diversity could be due to a multitude of factors, including low levels of food availability, poor child feeding practices, or deliberate underreporting. Chemba District is characterized by recurrent drought and floods, which affect crop production and food availability, and the majority of the population rely on unimodal rainfed agriculture. The baseline data survey took place during the growing season—a lean season typified by food scarcity.

2.6.3 Minimum Accepted Diet (MAD)—Children

110. Minimum Diet Diversity (MDD), Minimum Meal Frequency (MMF) and, a composite of the two, Minimum Acceptable Diet (MAD) are recommended indicators for assessing the nutritional status of children under two years and to evaluate the impact of nutrition interventions. The MAD indicator depends on whether the child is breastfed or not. As shown in Table 23, the baseline result shows that the prevalence of breastfed children is significantly higher both in the control (96%) and intervention (98%) villages, with no statistically significant difference between the two.

111. MDD measures the proportion of children 6-23 months of age who consumed food from four or more food groups during the previous day. MMF, on the other hand, measures the proportion of breastfed and non-breastfed children aged 6-23 months who receive solid, semi-solid, or soft foods, including milk for non-breastfed children a minimum number of times or more during the previous day. The minimum frequency is conditional on the child's age and whether the child is breastfed or not. It is two times for breastfed infants aged 6-8 months, three times for breastfed children aged 9-23 months, and four times for non-breastfed

aged 6-23 months. MAD is a composite indicator that measures proportion of children aged 6-23 months who can be considered as having a minimum acceptable diet.

112. Table 23 shows summary statistics for MDD, MMF and MAD disaggregated by age across the intervention and control villages. The baseline results indicate that almost no children aged 6-23 months met the cut-off for MDD (≥ 4 food groups). This is largely driven by low levels of dietary diversity, as indicated Figure 19.

Table 23: Means of MDD, MMF and MAD outcomes the previous day for children aged 6-23 months

Variable	Control (1) Mean	Intervention (2) Mean	Dif. (2-1)
Pooled sample			
Breast milk	0.961	0.982	0.020
	(0.193)	(0.135)	(0.016)
MDD	0.003	0.014	0.011
	(0.050)	(0.116)	(0.008)
MMF	0.114	0.159	0.0345
	(0.319)	(0.366)	(0.031)
MAD	0.003	0.011	0.009
	(0.050)	(0.106)	(0.007)
Observations	**341**	**339**	**680**
Child age 6-11 months			
MDD	0.003	0.016	0.013
	(0.056)	(0.126)	(0.010)
MMF	0.126	0.187	0.061
	(0.333)	(0.391)	(0.038)
MAD	0.003	0.015	0.012
	(0.056)	(0.121)	(0.010)
Observations	**280**	**271**	**551**
Child age 12-17 months			
MDD	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
MMF	0.071	0.062	-0.009
	(0.26)	(0.245)	(0.059)
MAD	0.000	0.000	0.000
MDD	(0.000)	(0.000)	(0.000)
Observations	**48**	**36**	**84**
Child age 18-23 months			
MDD	0.000	0.013	0.013
	(0.000)	(0.117)	(0.014)
MMF	0.058	0.07	0.074
	(0.243)	(0.259)	(0.175)
MAD	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Observations	**13**	**28**	**41**

* p<0.1, ** p<0.05, *** p<0.01; standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in population across intervention and comparison villages

2.6.3 Under-2 and Under-5 Anthropometric Results

113. Malnutrition refers to deficiencies, excesses, or imbalances in food intake in terms of energy and/or nutrients. Malnutrition manifests itself in various forms including poor child growth (stunting, wasting and,

underweight); inadequate micronutrients, such as vitamins and minerals; excess weight or body fat (overweight and obesity); and is associated with non-communicable diseases, such as diabetes, cardiovascular disease and some cancers.[48] This section assesses the nutritional status of children under 2 (i.e. 6-23 months) and those between 2 and 5 years of age (i.e. 23-59 months) that were measured during GTNS's baseline survey. This survey collected anthropometric data from a total of 1517 children based on physical body measurements of weight, height/length and how they relate to the age and sex of the child. Out of the 1517[49] anthropometric measurements, only 997 were within acceptable ranges to be used for final analysis.

114. Table 24 shows the distribution of the final accepted anthropometric measurements disaggregated by intervention village status and gender for children under-2. The anthropometric measurements were used to construct the main indices that are used to classify the nutritional status of children, i.e. Height-for-age (HAZ), Weight-for-age (WAZ), Weight-for-height (WHZ), and the Mid-Upper Arm Circumference (MUAC). The indices were then used to classify children as underweight (moderate and severe), stunted (moderate and severe), wasted (moderate and severe), and overweight (including obesity). In addition, the study also assessed the bilateral pitting edema[50], a clinical sign of severe acute malnutrition (SAM).

(i) Height/length-for-age (HAZ)

115. The HAZ index reflects the cumulative linear growth of the height or length[51] of a child and is used to measure stunting. A child is classified as stunted if they are too short for their age. For children under five years of age, stunting is measured as the height/length-for-age that is less than -2 standard deviations[52] below the WHO Child Growth Standards median[53]. Factors that contribute to stunted growth in children within the first 1,000 days include nutritional deprivation, lack of proper water and sanitation, poor maternal health, inadequate infant and young child feeding practices, and recurrent infections. Long-term effects of stunting include impaired cognitive ability and reduced school and work performance.[54]

116. Results based on the height/length-for-age scores in Table 24, show the prevalence of stunting in the control and intervention samples of children between 6 and 23 months. Overall, results from the pooled sample shows that on average, around 33% of all children in this age-group are stunted in both the intervention and control samples. Of the stunted children, between 20% and 23% in the control and intervention villages are moderately stunted, respectively. The prevalence of severe stunting is about 14% among all children in the control villages compared to 10% in the intervention villages. When disaggregated by gender, the results show that stunting is slightly higher among male children at 40% in both the control and intervention villages, compared to an average of about 25% among female children in both the control and intervention villages. Similarly, severe stunting is also slightly higher among male children at 16% in control villages compared to 10% in the intervention villages. Among female children, the prevalence of severe stunting is about 16% in control villages, compared to 10% in the intervention villages. However, it is important to take note that all the mean differences in the prevalence of stunting and its extent (moderate and severe) among children 6-23 months of age, disaggregated by gender and treatment village statue, are not statistically significant.

117. The results for children between 24 and 59 months based on the height/length-for-age scores (Table 25), reveal higher prevalence rates of stunting. First, an average of between 45% and 50% of the pooled

[48] WHO. (2019). Essential nutrition actions: mainstreaming nutrition through the life-course. World Health Organization.
[49] Of this total sample, 520 measurements were rejected because they had Z scores values were <−6 or >+6 relative to the WHO reference standards Mercedes De Onis et al., , 'Development of a WHO Growth Reference for School-Aged Children and Adolescents' [2007] Bulletin of the World Health Organization; WHO, *Interpreting Growth Indicators* (2008).
[50] In this study, none of the 997 children diagnosed by the field team showed any signs of Edema.
[51] For children under 24 months of age, the length is measured with the child lying down, while for children 2-5 years, the height is measured while the child is standing.
[52] WHO. (2006). WHO Child Growth Standards based on length/height, weight and age. Acta Paediatrica, International Journal of Paediatrics, 95(SUPPL. 450), 76–85; De Onis, M., Borghi, E., Arimond, M., Webb, P., Croft, T., Saha, K., … Flores-Ayala, R. (2019). Prevalence thresholds for wasting, overweight and stunting in children under 5 years. *Public Health Nutrition*, *22*(1), 175–179.
[53] (i) Stunting: HAZ<− 2 SD, moderate stunting: HAZ<=−3 to <− 2 SD, and severe stunting HAZ<−3 SD from the WHO standards median
[54] WHO. (2019). Essential nutrition actions: mainstreaming nutrition through the life-course. World Health Organization.

children in this age group are stunted in the control and intervention villages, respectively. When disaggregated by gender, we find no significant differences in the prevalence of stunting and its severity between female children in the intervention and control villages. On average, between 49% and 57% of all female children are stunted, with between 29 and 35% moderately stunted around 21% and 22% severely stunted between control and intervention villages, respectively.

Table 24: Prevalence of stunting, wasting and undernourishment for children 6 to 23 months

	Pooled			**Females**			**Males**		
	Control[1]	Inter.[2]	Dif.	Control[3]	Inter.[4]	Dif.	Control[5]	Inter.[6]	Dif.
Variable	Mean	Mean	(2)-(1)	Mean	Mean	(4)-(3)	Mean	Mean	(6)-(5)
Height-for-age (HAZ)									
Stunting	0.337	0.323	-0.014	0.262	0.250	-0.012	0.398	0.396	-0.003
	(0.473)	(0.468)	(0.768)	(0.441)	(0.435)	(0.845)	(0.491)	(0.491)	(0.966)
Moderate stunting	0.202	0.227	0.025	0.158	0.157	-0.001	0.238	0.296	0.058
	(0.402)	(0.419)	(0.530)	(0.366)	(0.365)	(0.981)	(0.427)	(0.458)	(0.334)
Severe stunting	0.135	0.096	-0.039	0.104	0.093	-0.011	0.160	0.100	-0.061
	(0.342)	(0.296)	(0.170)	(0.306)	(0.291)	(0.803)	(0.368)	(0.301)	(0.101)
Weight-for-age (WAZ)									
Underweight	0.255	0.244	-0.011	0.191	0.207	0.016	0.307	0.281	-0.026
	(0.436)	(0.430)	(0.804)	(0.394)	(0.406)	(0.766)	(0.462)	(0.451)	(0.656)
Moderate underweight	0.184	0.173	-0.011	0.130	0.162	0.032	0.228	0.184	-0.044
	(0.388)	(0.379)	(0.760)	(0.337)	(0.370)	(0.440)	(0.420)	(0.389)	(0.391)
Severe underweight	0.071	0.071	-0.000	0.061	0.045	-0.016	0.079	0.097	0.018
	(0.257)	(0.257)	(0.993)	(0.240)	(0.207)	(0.643)	(0.270)	(0.296)	(0.643)
Weight-for-height (WHZ)									
Wasting	0.107	0.078	-0.029	0.099	0.056	-0.042	0.114	0.099	-0.015
	(0.310)	(0.268)	(0.286)	(0.299)	(0.231)	(0.218)	(0.318)	(0.300)	(0.705)
Moderate wasting	0.099	0.055	-0.043*	0.090	0.027	-0.063**	0.106	0.084	-0.022
	(0.299)	(0.229)	(0.072)	(0.287)	(0.163)	(0.023)	(0.308)	(0.278)	(0.538)
Severe wasting	0.008	0.022	0.014	0.009	0.029	0.020	0.008	0.016	0.008
	(0.091)	(0.148)	(0.265)	(0.094)	(0.169)	(0.338)	(0.089)	(0.124)	(0.470)
Overweight	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	()	(0.000)	(0.000)	()	(0.000)	(0.000)	()
Obesity	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	()	(0.000)	(0.000)	()	(0.000)	(0.000)	()
Mid-Upper Arm Circumference (MUAC)									
Global acute malnutrition	0.170	0.115	-0.055	0.256	0.118	-0.138***	0.100	0.113	0.013
	(0.376)	(0.320)	(0.133)	(0.438)	(0.324)	(0.010)	(0.300)	(0.317)	(0.786)
Moderate acute malnutrition	0.147	0.095	-0.052	0.211	0.092	-0.119**	0.095	0.097	0.002
	(0.355)	(0.293)	(0.126)	(0.409)	(0.290)	(0.017)	(0.294)	(0.297)	(0.970)
Severe acute malnutrition	0.018	0.013	-0.005	0.040	0.010	-0.030	0.000	0.016	0.016*
	(0.133)	(0.113)	(0.667)	(0.196)	(0.102)	(0.199)	(0.000)	(0.124)	(0.082)
Observations	**363**	**330**	**693**	**165**	**164**	**329**	**198**	**166**	**364**

Notes: Stunted children include both moderately and severely stunted children. Wasted children are the sum of moderately and severely wasted children. Underweight children also include the sum of moderately and severely underweight children. * p<0.1, ** p<0.05, *** p<0.01; standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in population across intervention and comparison villages

118. Considering the sub-sample of male children, the prevalence of stunting is 45% in the intervention villages compared to 39% in the control villages, and this difference is not statistically significant. However, when disaggregated by gender, we find that there are twice as many male children that are moderately stunted within the intervention villages (39%) compared to the control (19%) and this difference is statistically significant at the 1% level. In contrast, there are more male children that are severely stunted in the control (20%) compared to the intervention (7%) villages and this difference is statistically significant at the 5% level.

Other studies conducted in Mozambique in the past report prevalence rates of stunting among children under 5 to be on average 43% based on nationally representative data [55], while others at provincial level reported stunting rates of 11% among sick children in Maputo Province[56] and two studies conducted in Tete province reported 36%[57] and 39%.[58]

Table 25: Prevalence of stunting, wasting and undernourishment for children 24 to 59 months

	Pooled			Females			Males		
	Control[1]	Inter.[2]	Dif.	Control[3]	Inter.[4]	Dif.	Control[5]	Inter.[6]	Dif.
Variable	Mean	Mean	(2)-(1)	Mean	Mean	(4)-(3)	Mean	Mean	(6)-(5)
Height-for-age (HAZ)									
Stunting	0.447	0.504	0.057	0.494	0.569	0.074	0.389	0.454	0.065
	(0.499)	(0.501)	(0.415)	(0.503)	(0.499)	(0.450)	(0.491)	(0.500)	(0.451)
Moderate stunting	0.245	0.373	0.128**	0.290	0.352	0.062	0.190	0.389	0.198***
	(0.431)	(0.485)	(0.015)	(0.456)	(0.481)	(0.433)	(0.395)	(0.490)	(0.004)
Severe stunting	0.202	0.131	-0.071	0.205	0.217	0.012	0.199	0.065	-0.133**
	(0.403)	(0.338)	(0.116)	(0.405)	(0.415)	(0.879)	(0.402)	(0.248)	(0.032)
Weight-for-age (WAZ)									
Underweight	0.237	0.185	-0.052	0.229	0.288	0.058	0.246	0.107	-0.139*
	(0.426)	(0.389)	(0.349)	(0.422)	(0.456)	(0.496)	(0.433)	(0.310)	(0.065)
Moderate underweight	0.181	0.149	-0.032	0.170	0.213	0.042	0.194	0.100	-0.094
	(0.386)	(0.357)	(0.538)	(0.378)	(0.412)	(0.616)	(0.398)	(0.302)	(0.154)
Severe underweight	0.056	0.036	-0.020	0.059	0.075	0.016	0.052	0.006	-0.045
	(0.230)	(0.187)	(0.471)	(0.236)	(0.265)	(0.764)	(0.223)	(0.079)	(0.128)
Weight-for-height (WHZ)									
Wasting	0.043	0.016	-0.027	0.053	0.037	-0.016	0.032	0.000	-0.032
	(0.204)	(0.126)	(0.165)	(0.224)	(0.190)	(0.630)	(0.177)	(0.000)	(0.107)
Moderate wasting	0.043	0.016	-0.027	0.053	0.037	-0.016	0.032	0.000	-0.032
	(0.204)	(0.126)	(0.165)	(0.224)	(0.190)	(0.630)	(0.177)	(0.000)	(0.107)
Severe wasting	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	()	(0.000)	(0.000)	()	(0.000)	(0.000)	()
Overweight	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	()	(0.000)	(0.000)	()	(0.000)	(0.000)	()
Obesity	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	()	(0.000)	(0.000)	()	(0.000)	(0.000)	()
Mid-Upper Arm Circumference (MUAC)									
Global acute malnutrition	0.021	0.025	0.003	0.039	0.015	-0.024	0.000	0.032	0.032
	(0.145)	(0.155)	(0.886)	(0.195)	(0.124)	(0.346)	(0.000)	(0.176)	(0.312)
Moderate acute malnutrition	0.016	0.025	0.008	0.030	0.015	-0.015	0.000	0.032	0.032
	(0.128)	(0.155)	(0.703)	(0.172)	(0.124)	(0.530)	(0.000)	(0.176)	(0.312)
Severe acute malnutrition	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	()	(0.000)	(0.000)	()	(0.000)	(0.000)	()
Observations	**148**	**156**	**304**	**79**	**71**	**150**	**69**	**85**	**154**

[55] UNICEF, WHO, & WB. (2016). Joint child malnutrition estimates (JME). Retrieved June 1, 2020, from http://data.worldbank.org/data-catalog/world-development-indicators

[56] Nhampossa, T., Sigaúque, B., MacHevo, S., MacEte, E., Alonso, P., Bassat, Q., … Fumadó, V. (2013). Severe malnutrition among children under the age of 5 years admitted to a rural district hospital in southern Mozambique. *Public Health Nutrition*. https://doi.org/10.1017/S1368980013001080

[57] García Cruz, L. M., González Azpeitia, G., Reyes Súarez, D., Santana Rodríguez, A., Loro Ferrer, J. F., & Serra-Majem, L. (2017). Factors associated with stunting among children aged 0 to 59 months from the central region of Mozambique. *Nutrients*. https://doi.org/10.3390/nu9050491

[58] Daniel, J. B., Pinto, E., Queiroz, V. de O., & Oliveira, A. M. de. (2019). The Determinants of Anthropometric Deficits in Children under Five Years Old in Tete Province Mozambique Using Hierarchy Approach. *Open Journal of Epidemiology*. https://doi.org/10.4236/ojepi.2019.91002

Notes: Stunted children include both moderately and severely stunted children. Wasted children are the sum of moderately and severely wasted children. Underweight children also include the sum of moderately and severely underweight children. * p<0.1, ** p<0.05, *** p<0.01; standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in population across intervention and comparison villages

119. Figure 20 shows the stunting rates pooled for all children below 5 years of age in Mozambique, based on nationally representative estimates from the World Development Indicators (WDI) for three time periods 2008, 2011 and 2015 as well as the baseline estimates from the GTNS intervention and control villages conducted in 2020. The national prevalence of under-five stunting for boys averaged between 45% and 47%, while that of girls averaged between 38% and 41% across the three time periods. The average stunting rates among the GTNS sampled villages in Chemba are 42% for boys and 36% for girls. Although the GTNS prevalence of stunting estimates are slightly lower than national averages (which modestly reduced over the three years), they are significantly greater than the WHO severity index[59,60], the developing countries average of (25%)[61], and the global average of 22%.[62] This is hardly surprising as it is well documented that Mozambique has one of the highest prevalence of stunting in the world among children under the age of five years, even though the severity and underlying drivers may vary depending on locality.[63, 64, 65, 66] An estimated 144 million (approximately 22%) of children under 5 in the world were stunted with 57.5 million (approximately 30%) of them living in Africa in 2019.67

120. Some the main underlying causes of stunted growth, also known as chronic malnutrition among children in Mozambique include inadequate nutritional intake and diet diversity such as low micronutrient-rich foods (other vegetables, fruit, and foods of animal origin), poor knowledge of healthy foods, inadequate food preparation, infrequent meals and high levels of disease.[68,69] As already highlighted, Chemba District is classified as category 3—severely chronically food insecure, hence the high stunting prevalence. The internationally recognized window of opportunity to impact stunted growth in children, is within the first 1,000 days, from conception until a child turns two years old. Otherwise, if not treated, chronic malnutrition can lead to long-term developmental risks in children.

121. In recognition of this ubiquitous problem, the Government of Mozambique's Five-Year Plan (PQG 2015-2019) of 2015 includes the reduction of stunting as one of the key indicators. International policy and guidance posit that to achieve a reduction in stunting multi-sectoral, multi-stakeholder programming is required. Under the UN Agenda for the Reduction of Chronic Undernutrition (2015-2019) for Mozambique,

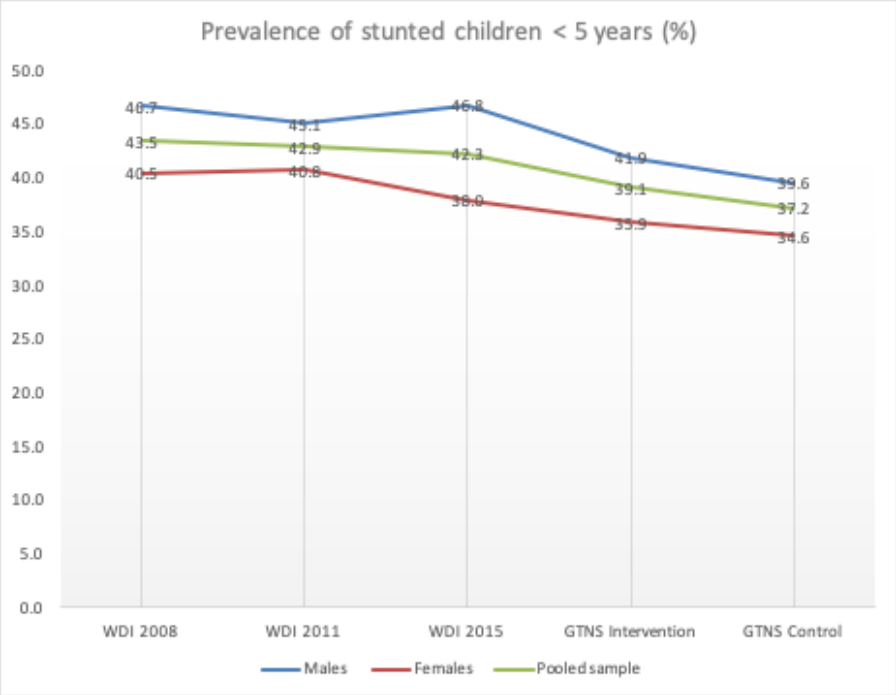
[59] WHO stunting thresholds are: 'low' (<20 %); 'medium' (20–29 %); 'high' (30–39 %); and 'very high' (≥40 %)
[60] De Onis, M., & Blössner, M. (1997). WHO Global Database on Child Growth and Malnutrition. *Programme of Nutrition World Health Organization Geneva*. Available at: https://apps.who.int/iris/bitstream/handle/10665/63750/WHO_NUT_97.4.pdf?sequence=1
[61] Global Nutrition Report (2020). Mozambique Nutrition Profile. Available at: https://globalnutritionreport.org/resources/nutrition-profiles/africa/eastern-africa/mozambique/#profile
[62] Global Nutrition Report (2020). Country Nutrition Profiles. Available at https://globalnutritionreport.org/resources/nutrition-profiles/
[63] The 2016 Global Nutrition Report (2016). Available at: https://globalnutritionreport.org/reports/2016-global-nutrition-report
[64] García Cruz, L. M., González Azpeitia, G., Reyes Súarez, D., Santana Rodríguez, A., Loro Ferrer, J. F., & Serra-Majem, L. (2017). Factors associated with stunting among children aged 0 to 59 months from the central region of Mozambique. *Nutrients*
[65] Nhampossa, T., Sigaúque, B., MacHevo, S., MacEte, E., Alonso, P., Bassat, Q., … Fumadó, V. (2013). Severe malnutrition among children under the age of 5 years admitted to a rural district hospital in southern Mozambique. Public Health Nutrition. https://doi.org/10.1017/S1368980013001080
[66] Republic of Mozambique (2010). Mozambique Multisectoral Action Plan for the Reduction of Chronic Undernutrition in Mozambique 2011 – 2014 (2020). Available at: https://www.who.int/nutrition/landscape_analysis/MozambiqueNationalstrategyreductionstunting.pdf?ua=1
[67] UNICEF, WHO, & World Bank. (2020). Levels and trends in child malnutrition: Key findings of the 2020 Edition of the Joint Child Malnutrition Estimates. Geneva: WHO. Joint Child Malnutrition Estimates, UNICEF, WHO and the World Bank Group. https://doi.org/10.18356/6ef1e09a-en
[68] United Nations (2015). Common Agenda for the Reduction of Chronic Undernutrition. Maputo.
[69] WFP (2017). Mozambique Country Strategic Plan (2017–2021). Available at: http://www.acsd.africa/static/site/pdf/mozambique/1.pdf

FAO, IFAD, UNFPA, UNICEF, WFP and WHO, aim to work more effectively together in reducing chronic undernutrition from an average of 43% in 2013 to 35% by 2019.[70]

(ii) Weight-for-age (WAZ)

122. The WAZ is a common anthropometric measure required that measures the body mass relative to the age and can be used to classify the prevalence of underweight children. For children under five years of age, being underweight is defined as weight-for-age that is less than -2 standard deviations[71] below the WHO Child Growth Standards median[72]. The results in Table 24, show no significant differences in the prevalence rates for underweight (moderate and severe) between the control and intervention samples among children that are 6 to 23 months, when disaggregated by gender.

123. The prevalence rate for children in the pooled sample that are underweight, moderately underweight, and severely underweight is approximately 25%, 18% and 7%, respectively. Within the sub-sample of female children in this age group, we find that the prevalence rate for underweight, moderately underweight, and severely underweight are also not very different between control and intervention villages with combined averages of around 20%, 14% and 5%, respectively. Similarly, the prevalence rate for underweight, moderately underweight and severely underweight are also not very different between control and intervention villages for male children with combined averages of around 29%, 20% and 8%, respectively. These rates are averaged for both the control and intervention samples because the slight differences in their means which are all less than 3%.



Notes: World Development Indicators (WDI) are estimates of child malnutrition (0-59months), from Mozambique, based on national survey data harmonized by UNICEF, WHO, and the World Bank for the year 2008, 2011 and 2015[1]. GTNS estimates based on anthropometric data from 997 children collected in a baseline survey in 2020 in Chemba district in Mozambique

Figure 20: Prevalence of stunting rates among children under 5 years based on WDI estimates and GTNS survey

[70] FAO, IFAD, UNICEF, UNFPA, WFP, WHO and REACH (2015). The United Nations Agenda for the Reduction of Chronic Undernutrition in Mozambique (2015-2019), Available at: http://scalingupnutrition.org/wp-content/uploads/2016/02/UN-Agenda-for-the-Reduction-of-Chronic-Undernutrition-Mozambique.pdf

[71] WHO. (2006). WHO Child Growth Standards based on length/height, weight and age. *Acta Paediatrica, International Journal of Paediatrics*, *95*(SUPPL. 450), 76–85. https://doi.org/10.1080/08035320500495548

[72] (i) Underweight: WAZ<− 2 SD, moderate underweight: WAZ<=−3 to <− 2 SD, and severe underweight: WAZ<−3 SD from the WHO standards median

(iii) Weight-for-age (WAZ)

124. The WAZ is a common anthropometric measure that measures the body mass relative to the age and can also be used to classify the prevalence of underweight children. For children under five years of age, being underweight is defined as weight-for-age that is less than -2 standard deviations[73] below the WHO Child Growth Standards median[74]. The results in Table 24, show no significant differences in the prevalence rates for underweight (moderate and severe) between the control and intervention samples among children that are 6 to 23 months, when disaggregated by gender.

125. The prevalence rate for children in the pooled sample that are underweight, moderately underweight, and severely underweight is approximately 25%, 18% and 7%, respectively. Within the sub-sample of female children in this age group, we find that the prevalence rate for underweight, moderately underweight and severely underweight are also not very different between control and intervention villages with combined averages of around 20%, 14% and 5%, respectively. Similarly, the prevalence rate for underweight, moderately underweight and severely underweight are also not very different between control and intervention villages for male children with combined averages of around 29%, 20% and 8%, respectively. These rates are averaged for both the control and intervention villages because the slight differences in their means which are all less than 3%.

126. Considering the WAZ for children that are 24 to 59 months shown Table 25, we find that in general, there are no statistical differences between control and intervention villages in the prevalence rates of underweight, moderately underweight and severely underweight. This is with the exception of the male group where we find that there are significantly more male children in the control sample (25%) that are underweight compared to the intervention villages (11%). Prevalence of moderate and severe underweight among male children show no statistical differences between control and intervention villages.

127. We also do not find any statistical differences between female children in the control and intervention villages. More specifically, the prevalence rates of (i) children underweight are 23% (control) compared to 29% (intervention); (ii) moderate underweight are 17% (control) compared to 21% (intervention); and (iii) severe underweight are 6% (control) compared to 8% (intervention). According to data from[75], the prevalence of underweight children below five years of age has been declining in Mozambique from a national average of 25% in 1996 to about 15% in 2015. These estimates generally show the prevalence of stunting being consistently higher among male children than female children.

(iv) Weight-for-height (WHZ)

128. WHZ measures body weight relative to height. A child that is too thin for his or her height due to rapid weight loss or the failure to gain weight is referred to as being wasted. One of the major causes of wasting is as a result of an unbalanced nutritional diet and recurring infections and can adversely affect linear growth and, therefore, undermine child growth and development. For children under five years of age, wasting is defined as weight-for-height that is less than -2 standard deviations below the WHO Child Growth Standards median. Overweight is defined as weight-for-height greater than 2 standard deviations[76] above the WHO Child Growth Standards median, and obesity as weight-for-height greater than 3 standard deviations above the WHO Child Growth Standards median[77]. Body mass index (BMI) is an index of weight-for-height commonly used to classify children as overweight or obese[78].

[73] WHO. (2006). WHO Child Growth Standards based on length/height, weight and age. *Acta Paediatrica, International Journal of Paediatrics*, *95*(SUPPL. 450), 76–85. https://doi.org/10.1080/08035320500495548

[74] (i) Underweight: WAZ<− 2 SD, moderate underweight: WAZ<=−3 to <− 2 SD, and severe underweight: WAZ<−3 SD from the WHO standards median

[75] UNICEF, WHO, & WB. (2016). Joint child malnutrition estimates (JME). Retrieved June 1, 2020, from http://data.worldbank.org/data-catalog/world-development-indicators

[76] WHO. (2006). WHO Child Growth Standards based on length/height, weight and age. *Acta Paediatrica, International Journal of Paediatrics*, *95*(SUPPL. 450), 76–85. https://doi.org/10.1080/08035320500495548.

[77] (i) Wasting: WHZ is <− 2 SD, Moderate wasting: WHZ is <=−3 to <− 2 SD, and severe wasting: WHZ <−3 SD from the WHO standards median. Overweight: WHZ >2 and obesity: WHZ <−3 SD from the WHO standards median

[78] WHO. (2014). WHA Global Nutrition Targets 2025: Stunting Policy Brief. Rome: World Health Organization (WHO). https://doi.org/WHO/NMH/NHD/14.3

129. Results in Table 24 reveal that children between 6 and 23 months in the control and intervention samples are at generally similar levels in terms of the prevalence of wasting. Overall, the prevalence rates for wasting are (i) 11% in control compared to 8% in intervention in the pooled sample, (ii) 10% in control compared to 6% in intervention among female children and (iii) 11% in control compared to 10% in the intervention sample among male children. These differences are not statistically significant.

130. In the pooled sample, we find the prevalence of moderate wasting to be significantly higher among children in the control (10%) compared to intervention villages (6%). When disaggregated by gender, again the prevalence of moderate wasting among female children is significantly higher in the control (9%) than in the intervention (3%) sample. For the male sample, the prevalence of moderately wasted children stands at 11% and 8% in the control and intervention villages, respectively. Incidences of severe wasting are very low in this age group, with the highest prevalence being that of female children in the control villages having about 3%. There is also no prevalence of overweight and obese children in this age group.

131. For children 24-59 months (Table 25), we find no significant differences in the prevalence of wasting and its severity disaggregated by intervention and gender. More specifically, prevalence of wasting and moderate are all below 5%, while there are no cases of severe wasting among female and male children. The results also show that there is almost no prevalence in overweight and obesity. Wasting can be treated through improved nutritional intakes, health-care interventions and intervention of infection. One of the six global nutrition targets for 2025 is to reduce and maintain wasting among children under five years to less than 5%.[79]

132. Figure 21 shows the prevalence of wasting pooled for all children below 5 years of age in Mozambique, based on nationally representative estimates from the World Development Indicators (WDI) for three time periods 2008, 2011 and 2015 as well as the baseline estimates from the GTNS intervention and control villages conducted in 2020. The national prevalence of under-five wasting among boys averaged 5%, 7% and 4%, while that of girls averaged 4%, 6% and 5% in 2008, 2011 and 2015, respectively. The average wasting rates among the GTNS sampled villages in Chemba are 6% for boys and 5% for girls in the intervention villages and 9% for boys and 8% for girls in the control villages. The prevalence of wasted children in the control villages is greater than the global average for under-5s, which stands at 7%[80]. When further disaggregated by age group, the prevalence of wasting estimates in the control villages for children 6-23 months are 10% for boys and 11% for girls, while those for the intervention villages are 10% for boys and 6% for girls. Except for the girls in the intervention villages, the rates for the other three groups in this age class are classified as serious based WHO's severity index[81,82,,83] Wasting is usually the result of significant food shortage, poor nutrient intake and/or disease, thus tend to vary during different times of the season, with the highest prevalence expected during the lean season, when food availability is at its lowest.[84] The symptoms of wasting among children include weakened immunity, susceptibility to long-term developmental delays, and an increased mortality risk, especially in cases of severe wasting. Children severely wasted would require urgent feeding, treatment and care to survive. Globally, an estimated 47 million (approximately 6.9%) of children under 5 were wasted (moderate and severe), with 12.7 million (approximately 6%) of them living in Africa in 2019.[85]

[79] WHO. (2014). Global targets 2025. To improve maternal, infant and young child nutrition. Geneva: World Health Organization (WHO).

[80] Global Nutrition Report (2020). Country Nutrition Profiles. Available at https://globalnutritionreport.org/resources/nutrition-profiles/

[81] WHO wasting thresholds are: 'Acceptable'(<5%);'Poor'(5–9%);'Serious'(10–14 %); and 'critical'(≥15 %).

[82] De Onis, M., & Blössner, M. (1997). WHO Global Database on Child Growth and Malnutrition. *Programme of Nutrition World Health Organization Geneva*. Available at: https://apps.who.int/iris/bitstream/handle/10665/63750/WHO_NUT_97.4.pdf?sequence=1

[83] De Onis, M., Borghi, E., Arimond, M., Webb, P., Croft, T., Saha, K., … Flores-Ayala, R. (2019). Prevalence thresholds for wasting, overweight and stunting in children under 5 years. Public Health Nutrition. https://doi.org/10.1017/S1368980018002434

[84] WHO. (2014). WHA Global Nutrition Targets 2025: WastingPolicy Brief. Rome: World Health Organization (WHO). https://doi.org/WHO/NMH/NHD/14.3

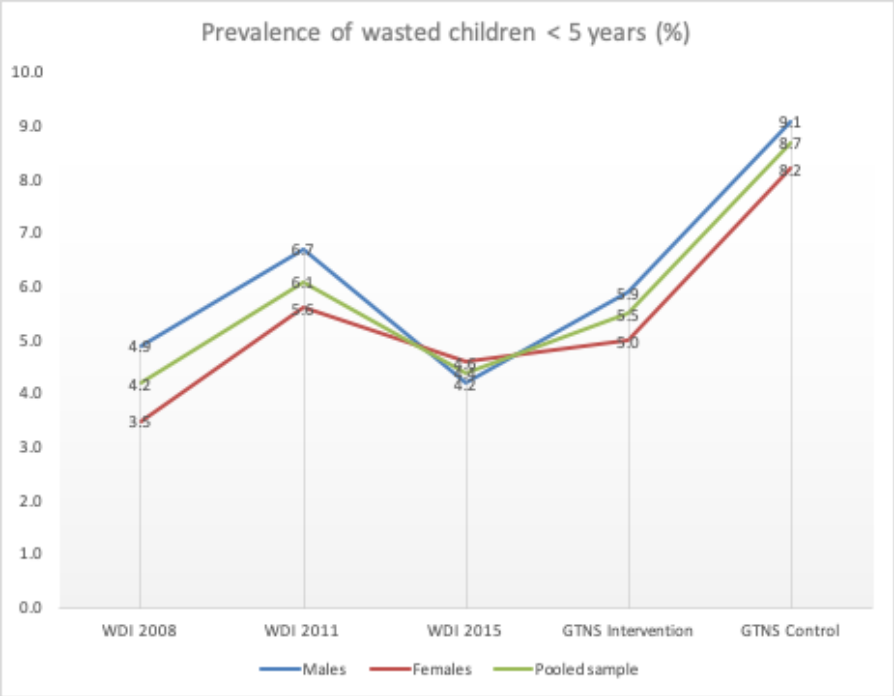
[85] UNICEF, WHO, & World Bank. (2020). Levels and trends in child malnutrition: Key findings of the 2020 Edition of the Joint Child Malnutrition Estimates. Geneva: WHO. Joint Child Malnutrition Estimates, UNICEF, WHO and the World Bank Group. https://doi.org/10.18356/6ef1e09a-en

133. MUAC measures the circumference of the left upper arm measured at the mid-point between the shoulder and elbow tips. The MUAC can be used as an alternative to WHZ in assessing the nutritional status of children[86]. For children under five years of age, global acute malnutrition is defined as MUAC that is less below 125 mm.[87]

134. Results in Table 25 show that prevalence of global acute malnutrition among all children that are between 6 and 23 months was about 17% in the control sample and 12% in the intervention sample. When disaggregated by gender, we find that the prevalence rates among female children was 26% in the control sample and 12% in the intervention sample (significant at 1% level). Among male children, the rates are between 10 and 11% for both the control and intervention villages, respectively.

135. The prevalence of moderate acute malnutrition stands at 15% in control and 10% in the intervention villages of the pooled sample. When disaggregated by gender the prevalence of moderate acute malnutrition is twice as high among female children in control villages (21%) compared to those in intervention (9%) areas. Among the male children sub-sample, the prevalence of moderate acute malnutrition is about 10% for both intervention and control villages. There are very few incidences of severe acute malnutrition and none exceed 3% across all sub-samples in this age group.

136. The prevalence of global acute malnutrition and moderate acute malnutrition among children that are aged 24 to 59 months are also very low, with none of the sub-samples (i.e., pooled, females and males) surpassing the 4% rate (Table 26). Among the male children sub-sample, the prevalence rate for severe acute malnutrition in the intervention villages is about two percent, compared to none within the control villages.



Notes: World Development Indicators (WDI) are estimates of child malnutrition (0-59 months), from Mozambique, based on national survey data harmonized by UNICEF, WHO, and the World Bank for the year 2008, 2011 and 20151. GTNS estimates based on anthropometric data from 997 children collected in a baseline survey in 2020 in Chemba district in Mozambique

Figure 21: Prevalence of stunting rates among children under 5 years based on WDI estimates and GTNS survey

[86] FANTA. (2016). Nutrition Assessment and Classification. *Nutrition Assessment, Counseling, and Support (NACS)*, *1*(1), 12. Retrieved from https://www.fantaproject.org/sites/default/files/resources/NACS-Users-Guide-Module2-May2016.pdf

[87] (i) Global acute malnutrition: MUAC<125; moderate acute malnutrition: MUAC ≥ 115 to < 125 mm and severe acute malnutrition: MUAC < 115 mm

3. Conclusions and Recommendations

3.1 Overall Assessment & Conclusion

137. WFP commissioned an evaluation of its GTNS project. One of its key elements is an impact evaluation, of which this BLR forms a key component. Baseline data collection took place from the 15th of February until the 15th of March 2020. Challenges were encountered in the field, which resulted is discarding some of the collected data. This was primarily due to: a) a failure too met two important inclusion criteria for the survey: household with a 6-23-month child and household with pregnant woman or child under 12 months; and b) a rejection of a large number of anthropometric measures, given their failure to fall within acceptable ranges. In the end, data from 640 households was retained for analysis, 82% of the originally targeted sample of 784 household (314 from 47 intervention villages and 326 from 49 matched control villages).

138. The baseline survey results validate the relevance of GTNS to the households, women, and children in both the intervention and control villages. The nutritional status of children is low, with 39% and 37% of under-fives being stunted in the intervention and control villages, respectively. The statistic is 33% in both sets of villages for under-2s. For this latter sub-group of children, very few reached the Minimal Acceptable Diet for Children (MAD) threshold. While GTNS's food assistance intervention already likely had an effect at the time of baseline data collection, with 46% of households in the intervention villages having acceptable food consumption scores against 9% among their counterparts in the control villages, household dietary diversity is a cause for concern. This is particularly the case for vitamin A and iron intake. Protein intake was considerably higher among households in the intervention villages but also with considerable room for improvement.

139. While arguably not as dire, the other outcome areas targeted by GTNS—women's and girl's empowerment, post-harvest loss (PHL), and health seeking attitudes and behaviour—are worthy of intervention as well. This is both for their intrinsic importance and as a means for both directly and indirectly improving the nutritional status of children. On a positive note, over 80% of children in both the intervention and comparison villages were delivered at a health facility, and over 70% of their mothers made at least four antenatal care visits prior to their birth. Moreover, 89% of caregivers in both sets of villages reported that they take their children to a medical facility or seek advice from a health profession when their child has a cough or fever. Finally, while not ideal, women's empowerment, as measured by the Pro-WEAI was found to be fair at 0.52 and 0.48 on a scale of 0 to 1 among surveyed women in the intervention and control villages, respectively.

140. On the more concerning side, the vast majority of households in both the intervention and control villages had to resort to one or more coping strategies, many of which fall under the emergency category, thereby highlighting their vulnerability. Moreover, over two-thirds of caregivers reported that the under-two children under their care had experienced one or more illnesses two weeks prior to the baseline survey. Fever and malaria were reported for approximately half of the under-2 children, and diarrhoea and cough among approximately one-fourth. Finally, most female respondents reported less than desirable attitudes towards contraceptive use and early marriage.

141. Table 26 summarizes the key findings of the baseline survey for the intervention and control groups by indicator.

3.2 Recommendations

142. We make four key recommendations:

143. **1. *Ensure GTNS's SBCC component adequately delivers nutrition educational messaging and targets men and adolescent boys, as well as women and adolescent girls:*** As presented above, improving dietary diversity is a key issue that needs to be addressed in order to improve nutritional outcomes among both pregnant and lactating women and under-five children. Evidence from other contexts shows that this does

not happen automatically with increased access to food or improvements in income.[88] A case in point is that the early distribution of food assistance appears to have had a positive impact on household consumption and, albeit more modestly, dietary diversity, but this does not seem to have trickled down to the targeted under-two children. GTNS's SBCC component is therefore both highly relevant and important. The behavioral messaging needs to be well tailored and developed if it is to elicit the desired behavior change. Exploring ways of informing such messaging through recent insights of behavioral science and economics is recommended.

144. The Busara Center for Behavioral Economics[89] has devised a simple framework that would be useful to consider in the design and implementation of GTNS's SBCC component: EAST (Easy, Attractive, Social, and Timely). Efforts should be scaled up, for example, to understand local feeding and food preparation practices and identify simple and implementable (i.e. **Easy**) nutrition improvement options households and mothers can readily undertake. Only providing general information in the absence of locally relevant and 'easily implementable' options will likely result in minimal behavior change, as will options that would be difficult and unrealistic for the majority of households to pursue, e.g. options requiring significantly longer food preparation time and effort or options for which ingredients are expensive and/or difficult to access.

145. The options should be **Attractive**, considering the local context as well. They should fit in with the foods that local people prefer and find tasty. Encouraging households to grow, purchase, and/or prepare food options that they are unfamiliar with is less likely to be successful. One critical element that is often overlooked in nutritional messaging is the economic attractiveness of the options in question. Poor households are generally not able to afford many recommended good dietary practices. Hence, an overly ambitious optimal diet messaging campaign could alienate the target population. This is especially significant in settings where males significantly influence food expenditure. When using women as the entry point for dietary change that entails increases in food expenditure, these dynamics may limit uptake and even exacerbate intra-household tensions. It is therefore important to involve men meaningfully in the intervention as well and be aware of the inherent financial limitations faced by households. Balancing nutrition and financial considerations will likely increase acceptability and increase the likelihood of desirable behavior change.

146. The **Social** element is also critical. People are also more likely to change their behavior when they see their peers or people they respect undertaking the behavior in question. For example, mothers can share what they are feeding their young children in peer groups, with those who are following good practice recognized and praised. There is also evidence that the way messages are structured and communicated matter.[90] For example, messages around child feeding practices can be more effective if they are given a personal touch, such as "Mothers of under-fives in your community promote their health and development by feeding them a diversity of good foods every day, including protein sources such as meat, legumes, and milk products and dark leafy vegetables and Vitamin A rich fruits." This is opposed to non-personalized messages, such as "To ensure good health and development, under-five children should consume a diversity of good foods every day, including protein sources such as meat, legumes, and milk products and dark leafy vegetables and Vitamin A rich fruits". **Timeliness** of interventions and messaging can also be important. If the consumption of particular foods is promoted when they are not seasonally available, there may be little uptake even when they come into season. Hence, the promotion of nutrition options will likely be more fruitful if their promotion is seasonally well timed.

147. Finally, it is widely acknowledged that changing gender relations necessitates engaging meaningfully with both women and men. Consequently, GTNS's SBCC component should design appropriate interventions that target both, building on insights obtained through the first KAP survey and address undesired attitudes evidenced in the baseline survey, e.g. those related to contraceptive use and early girl marriage.

148. **2. *Tailor GTNS's KAP and endline surveys to capture data and insights not covered by the baseline survey, including from men and adolescent boys and key contextual barriers that are likely to inhibit***

[88] http://www.unscn.org/files/Publications/Review-country-level-programming-nutrition-sensitive_agriculture-UNSCN.pdf
[89] https://www.busaracenter.org/
[90] https://academic.oup.com/jcr/article/35/3/472/1856257

***desired behavior change*.** The baseline survey captured data on a predefined set of quantitative indicators and did not comprise a qualitative component. Yet, additional context-related insights, e.g. barriers against accessing health care services and diversifying diets, would be useful for informing the detailed design of GTNS's interventions, as would understanding the knowledge and attitudes of men and adolescent boys and how these may change over the course of the project's lifespan. GTNS's planned KAP surveys should therefore be designed to address such prioritized gaps. Specific areas meriting further attention articulated during the report review process relate to better understanding: a) why some women are not delivering their babies at health facilities, so that interventions can be designed and implemented to respond to any identified constraints; b) the role of gender roles and dynamics in feeding practices to guide how women and men can be differentially targeted to bring about improvements; and c) the attitudes of women and men towards climate change and the adoption of drought and flood resistant crops, as well as any non-behavioral related barriers faced with respect to the latter, e.g. poor access to drought tolerate and flood resistant crop varieties. Finally, given the length of the survey instrument, data on some important indicators, such as the MDD-W, were not captured. Such data can still be captured at endline for single-difference impact estimation. That said, if cutting done on the number of indicators is non-negotiable, WFP may want to consider breaking down the survey administration over several sessions, given that data quality tends to degrade towards the end of long surveys.

Table 26: Baseline indicator status summary with target modification recommendations

#	GTNS Indicator	Intervention Villages	Control Villages	Initial Target	Recommendation for targets
1.	% of HH benefiting from food assistance	87%	3.4%	none	Set afresh
2.	Food consumption score (FCS) (% of HHs at Acceptable Level)	46%	9%	↑ by 5%	Increase significantly
3.	Food Consumption Score-Nutrition (FCS-N) d.Vit A rich foods (daily consumption) e.Protein rich foods (daily consumption) f. Hem Iron rich foods (daily consumption)	 8% 39% 0.7%	 7% 6% 0.5%	↑ by 5%	Increase for protein-rich foods
4.	Household Dietary Diversity Score (HDDS) (Substitute for MDD-W)	4.95	3.17	None	Set afresh
5.	Food expenditure share (FES) (% HHs with 65% FES or greater)	28%	48%	None	Set afresh
6.	Livelihood Coping Strategies Index (LCSI) (Average weighted score out of 29 possible points)	3.7	4.7	↑ by 30%	Maintain but phrase as reduction
7.	Reduced Coping Strategies Index (rCSI) (Average weighted score out of 56 points)	17.9	9.4	None	Set afresh
8.	Post-harvest losses (PHL) (Average % of crop lost post-harvest)	31%	26%	↓ by 5%	Consider decreasing further
9.	Women's decision-making participation d.Decisions on own health care access e.Decisions on visiting family members/relatives* f. Input into agriculture output and income use	 93% 90% 76%	 95% 93% 71%	↑ by 30%	Re-evaluate appropriateness of first two sub-indicators & reduce second by 10%
10.	Pro-WEAI (average index score)	0.52	0.48	None	Set afresh
11.	4+ antenatal care visits	73%	71%	↑ by 5%	Consider increasing to 10%
12.	Favorable attitude towards all 3 recommended practices (medical access & contraceptive use):	11%	6%	↑ by 25%	Maintain
13.	Favorable attitude against early marriage (Agree that it brings negative consequences)	26%	33%	None	Set afresh
14.	Assisted delivery at health facility (% of under-2s delivered at health facility)	82%	84%	↑ by 5%	Consider increasing to 10%
15.	Health seeking behavior (Healthcare visit or advice when child had cough/fever)	89%	89%	↑ by 3%	Consider increasing to 5%
16.	Prevalence of child illness	68%	74%	None	Set afresh

#	GTNS Indicator	Intervention Villages	Control Villages	Initial Target	Recommendation for targets
	(% with one or more reported illnesses previous 2 weeks)				
17.	Minimum acceptable diet for children age 6-23 (MAD): (% reaching cut-off)	1.1%	0%	↑ by 10%	Maintain
18.	Prevalence of stunting			↓ by	Maintain
	c. Under-2s	32%	34%	2%	
	d. Under-5s	39%	37%		
19.	Prevalence of wasting			None	Set afresh
	c. Under-2s	8%	11%		
	d. Under-5s	6%	9%		

149. ***3. Leverage GTNS's FFA and PHL components for sustainability.*** As highlighted above, there is evidence that GTNS's FFA component already made a difference, even following the one-off double distribution. There is an obvious concern that these benefits could discontinue once the distribution stops. The asset building component of GTNS's FFA component and the PHL component are designed to promote such sustainability. It is therefore critical that these two elements be designed and implemented well and with this in mind. Careful consideration should be made to evaluate whether the current plan and design for these components are sufficient to improve the food and nutritional security of the targeted households for the long-term.

150. ***4. Consider revising some of GTNS's indicator targets.*** In Table 26, we present the original project indicator targets and our recommendations for possible revisions. It should also be kept in mind that the many non-project related factors are likely to shape the trajectory of these indicators. Consequently, attention should be directed towards evaluating how these indicators change over GTNS's lifetime vis-à-vis the households, women, and children in the control villages, as envisaged in GTNS's impact evaluation design.

3.3 Lessons for future data collection

151. ***1. Ensure adequate lead time for data collection preparation and implementation:*** As discussed above, the implementation of GTNS's FFA component commenced prior baseline data collection. This, as described in the limitations section, will seriously affect the impact evaluation's ability to measure the full potential impacts of the project. Understandably, there was pressure to implement planned project activities on schedule. Consequently, in the future, efforts should be made to ensure there is adequate time to carryout baseline data collection prior to project activity implementation. Both preparing for and collection such data typically takes longer than planned. Arguably, from the time of ICRAF's and ELIM's engagement to the onset of baseline data collection, time was very limited to prepare, develop, and test the data collection instruments as well, which resulted in a rather rushed data collection effort.

152. ***2. Invest heavily in both field-level and remote data collection quality oversight****:* In hindsight, better efforts to check and oversee data quality should have taken place, both remotely through the server operated by ICRAF and in the field. For the former, this requires fulltime dedicated effort, so adequate time and budget should be set aside for this. For the latter, stricter procedures are needed to check, verify, and undertake corrective measures as necessary of inputted data in the field prior to uploading. Again, the pressure to complete the data collection exercise on time and within budget, despite unforeseen challenges experienced in the field, militated against through field-level data quality checking.

Annexes

Annex 1: Project Performance/Impact Indictors

#	Indicator	When	Unit of Analysis
1.1	Prevalence of stunting, disaggregated by age and sex (*2 percentage point improvement over the baseline*)	Baseline and End line	Under-2/5 children
1.2	Women's participation in household decision-making (access to healthcare, household purchases and visiting family members) **Note***: Key decisions will be determined as part of gender analysis and incorporated into the calculation of the indicator*	Baseline and End line	Women
2.1	Food Consumption Score, disaggregated by age and sex ***Note:*** *The household Food Consumption Score (FCS) is used as a proxy for household food security, to reflect quantity and quality of people's diets.*	Baseline and End line	Household
2.2	Food Consumption Score – Nutrition, disaggregated by age and sex. ***Note:*** *FCS-N is a measure of household's adequacy of key macro and micronutrients-rich food groups.*	Baseline and End line	Household
2.2b	Food Expenditure Share [FES]	Baseline And End line	Household
2.3	Minimum Dietary Diversity Score – Women (MDD-W), disaggregated by age[91] **Note:** *Minimum diet diversity is defined as consumption of 5 or more food groups out of 10 in the last 24 hours.*	Baseline and End line	Women
2.4	Minimum Acceptable Diet (MAD) – Children 6 – 23 months, disaggregated by age and sex. **Note:** *A child is classified as consuming a Minimum Acceptable Diet if s/he meet both (1) the minimum diet diversity AND (2) the minimum meal frequency.*	Baseline and End line	Children 6-23 months
2.5	Rate of post-harvest losses, disaggregated by age and sex Note: reported as average Smallholder farmers post-harvest losses of target crops as a percentage of annual production	Baseline and End line	Household
2.6a	Livelihood Coping Strategy Index (LCSI), disaggregated by age and sex. ***Note:*** *The livelihoods-based coping strategy index is used to better understand longer-term coping capacity of households.*	Baseline and End line	Household
2.6b	Consumption-based Coping Strategy Index, reduced CSI (rCSI)	Baseline And End line	Household
2.8	Attendance at 4+ antenatal care visits, disaggregated by age	Baseline And End line	Women
2.9	Assisted delivery at a health facility, disaggregated by age	Baseline And End line	Women
2.10	Prevalence and health seeking behaviour for fever, diarrhoea, and acute respiratory infection, disaggregated by age and sex[92]	Baseline And End line	Household
2.12	% of people that have a favourable **attitude** towards the recommended practices	Baseline And End line	Women
2.16	Women's Empowerment in Agriculture Index (WEAI)[93]	Baseline And End line	Woman
2.19	Wasting Low-Weight for Height	Baseline And End line	Under 2/5 child
#	**Indicator captured through KAP survey**	**When**	**Unit of Analysis**
2.11	Percent of people able to recall three key messages about dietary diversification, early marriage, early pregnancy, and SRH and child health services, disaggregated by age and sex	Baseline & Endline	Women
2.13	% of people who **intend to adopt** the recommended services	Baseline And Endline	Women
#	**Indicator captured only at end line**	**When**	**Unit of Analysis**
2.14	Proportion of households where women, men, or both women and men, make decisions on the use of food / cash / vouchers, disaggregated by type of transfer. ***Note:*** *This indicator is intended to measure equality in decision-making and control over cash, vouchers or food between women and men, at the household level;*	Baseline & End line	Household
	Indicator not captured by household survey	**When**	**Unit of Analysis**
2.18	Low birth weight[94] Note: proportion of infants with a low birth weight is an indicator of a multifaceted public health problem that includes long-term maternal malnutrition, ill health, hard work and poor health care in pregnancy	Baseline & End line	Infant

91 Household dietary diversity score used as substitute to reduce length of questionnaire.

92 Diarrhea component of this question unintentionally left out of the question addressed to respondents.

93 http://weai.ifpri.info/versions/weai/

94 Not possible to capture as part of household survey. Reviewing health centre records is likely the only viable option.

Annex 2: Terms of Reference

ToR for Baseline Survey - Austria 1910(

Annex 3: Evaluation Matrix

Refer to the TN on Evaluation Matrix

Overarching Question: *what is the contribution of the gender transformative and nutrition sensitive programme to improved nutritional diversity, reduction of stunting and empowerment women and girls?*

#	Evaluation questions [as per TOR]	Measure / Indicator of Success	Main sources of Information	Data Collection Methods	Data Analysis Methods	Evidence Availability / Reliability
Evaluation Criteria 1. **Effectiveness**					**Strong (Good)** **Medium (Satisfactory)** **Poor (Weak)**	
1.1.	To what extent were GTNS's output targets achieved for pregnant women, children under the age of 2, adolescent girls and boys?	• % output targets achieved or exceeded (disaggregated by sex and age as appropriate)	• Progress reports from implementing partners and WFP for planned activities and outputs.	• Report compilation	• Report review/analysis	Strong
1.2	To what extent were GTNS's primary target groups exposed to the project's integrated intervention model?	• Program exposure index	• Endline survey data	• Administration of endline survey	• Statistical and counterfactual analysis	Strong
1.3	To what extent were GTNS's knowledge, attitudes, and practices (KAP) outcome indicator targets achieved?	• KAP indicators • Extent to which GTNS KAP indicator targets were achieved	• Data from baseline and endline surveys • Data from KAP surveys	• Baseline and endline surveys • 2 KAP surveys	• Statistical and counterfactual analysis	Strong
1.4	To what extent were GTNS's interventions and implementation processes responsive to emerging challenges and opportunities in the implementation context?	• Extent of agreement between nature of emergent challenges and opportunities and adaptive measures undertaken.	• Interviews with relevant WFP and partner staff • In-depth interviews with village informants and beneficiaries	• Interviews with relevant WFP and partner staff • In-depth interviews with village informants and beneficiaries	• For each relevant emergent issue or opportunity, a quality rating with justification will be provided on adaptive measures undertaken.	Medium
Evaluation Criteria 2: **Efficiency**						
2.1.	To what extent were GTNS's activities implemented on time and was the duration of activity implementation conducive for generating GTNS's expected impacts on key target groups?	• % of project activities that were implemented on schedule • % of each target group that received support for intended duration and dose	• Project documents (planning, monitoring, activity report) • Progress reports from implementing partners • Endline survey data • WFP field staff, Implementing Partner staff • Community representatives and informants	• Review of relevant documentation • Report compilation • Administration of endline survey • Key informant interviews • In-depth interviews with village informants • FGDs with male and female beneficiaries	• Report review/analysis • Thematic and pattern analysis of qualitative data • Implementation timeline analysis • Statistical and counterfactual analysis	Strong

#	Evaluation questions [as per TOR]	Measure / Indicator of Success	Main sources of Information	Data Collection Methods	Data Analysis Methods	Evidence Availability / Reliability
2.2	To what extent did GTNS's interventions adhere to WFP's quality standards?	• Quality implementation adherence scores for each main project component	• Progress reports from implementing partners • Endline survey data • WFP field staff • Community representatives and informants	• Report compilation • Administration of endline survey • In-depth interviews	• Report review/analysis • Thematic and pattern analysis of qualitative data • Statistical and counterfactual analysis	Medium
2.3	Given the context and emerging conditions, to what extent were there opportunities to intervene and implement GTNS's core interventions in alternative ways that would have likely led to similar results but at less cost?	• Extent to which alternative approaches could have been undertaken that would have likely achieved a similar result at less cost.	• WFP and partner staff • Community representatives and informants	• In-depth interviews	• Thematic and pattern analysis of qualitative data	Medium
Evaluation Criteria 3: **Impact**						
3.1.	To what extent did GTNS achieve its higher-level outcome and impact targets, e.g. improve household food security and dietary diversity, empower women, and improve the nutritional status of under-five children?	• Change in high-level outcome and impact indicators among households, women, and under-2s/5s in the intervention and control villages	• Endline and baseline data from both intervention and comparison villages	• Administration of baseline and endline surveys on both households in intervention and matched control villages	• Econometric analysis of baseline and endline data	Strong
3.2	Is there evidence (either quantitative or qualitative) that GTNS impacted particular sub-groups of targeted beneficiaries differentially, e.g. those from relatively richer and poorer households?	• Changes in high-level outcome and impact indicators among different beneficiary categories.	• Endline and baseline data from both intervention and comparison villages	• Administration of baseline and endline surveys on both households in intervention and matched control villages	• Econometric analysis of baseline and endline data, using interaction tests to assess if there were an significant differential effects among subgroups.	Strong
3.3	Did key components of GTNS's intervention model contribute to the generation of any evidenced impacts more than others or was there significant synergy among these components?	• Changes all project outcome and impact indicators among those exposed to different combinations of project components	• Endline and baseline data from both intervention and comparison villages, including data on intervention exposure collected at endline • Community representatives and informants	• Baseline and endline surveys on both households in intervention and matched control villages • In-depth interviews with implementing partner local government, and WFP field staff, as well as community informants • In-depth interviews with project participants	• Econometric analysis of baseline and endline data • Thematic and pattern analysis of qualitative data	Medium

#	Evaluation questions [as per TOR]	Measure / Indicator of Success	Main sources of Information	Data Collection Methods	Data Analysis Methods	Evidence Availability / Reliability
3.4	Did GTNS generate any unplanned or unintended social, environmental or economic impacts, whether positive or negative, and, if so, how significant were these?	• Extent to which the project induced unexpected positive impacts • Extent to which the project induced unexpected negative impacts	• WFP field staff • Community representatives and informants • Implementing and local government partners	• In-depth interviews with implementing partner local government, and WFP field staff, as well as community informants • Focus group discussions with project participants	• Thematic and pattern analysis of qualitative data	Medium
Evaluation Criteria 5: **Sustainability [Scalability]**[95]						
4.1	What are key issues that are likely to affect the sustainability of GTNS's key outcomes and impacts and was sufficient action taken to address these? What gaps should be addressed, if any?	• Extent to which sufficient action was undertaken to address each key issue affecting the sustainability of GTNS's key outcomes and impacts	• WFP field staff • Community representatives and informants • Implementing and local government partners	• In-depth interviews with implementing partner local government, and WFP field staff, as well as community informants • Focus group discussions with project participants	• Thematic and pattern analysis of qualitative data	Strong
4.2	To what extent will any of GTNS's outcomes and impacts that are evidenced likely be sustained into the future? And does this potential vary across beneficiary categories?	• Extent to which evidenced outcomes and impacts induced by GTNS are likely to be sustained into the future, disaggregated by sub-group	• WFP field staff • Community representatives and informants • Implementing and local government partners	• In-depth interviews with implementing partner local government, and WFP field staff, as well as community informants • Focus group discussions with project participants	• Thematic and pattern analysis of qualitative data	Medium
4.3	Considering other possible intervention models, would it be cost-effective to scale out GTNS's integrated intervention model in other neighbouring communities and other contexts or would it be better to focus only on specific components? Under what conditions would such replication be fit-for-purpose and should any adaptation be considered accordingly? What are the barriers/opportunities to scaling up/replicating the GTNS model?	• Extent to which neighbouring communities and those in other contexts would likely benefit from GTNS' integrated intervention model vis-à-vis specific components • Extent to which specific conditions need to be in place to support replication and adaptations to the model made accordingly. • Number and type of barriers and opportunities	• WFP field staff • Community representatives and informants • Implementing and local government partners • Relevant WFP and government reports	• In-depth interviews with implementing partner local government, and WFP field staff, as well as community informants • Report compilation	• Analysis of intervention exposure data among project and non-project participants • Thematic and pattern analysis of qualitative data • Report synthesis/analysis	Strong

[95] The scalability dimension of the DAC evaluation criteria is part of a revised criteria. See details here https://ieg.worldbankgroup.org/sites/default/files/Data/DAC-Criteria/ConsultationReport_EvaluationCriteria.pdf

Annex 4: Data Collection Tools—Survey Instrument

Mozambique Gender Transformative and N

Annex 5: List of Acronyms

APE	Agentes Polivalentes Elementares
BLR	Baseline Report
CARI	Consolidated Approach to Reporting Indicators of Food Security
CBO	Community Based Organizations
CHA	Community Health Activists
CO	Country Office
CP	Country Programmes
DD	Difference-in-difference
DPASA	Provincial Agricultural and Food Security Directorate
DPS	Provincial Health Directorate
ELIM	ELIM Serviços Lda
EM	Evaluation Manager
ENA	Emergency Nutrition Assessment
ET	Evaluation Team
FAO	Food and Agriculture Organization of the United Nations
FCS	Food Consumption Score
FCS-N	Food Consumption Score Nutritional Quality Analysis
FFA	Food Assistance for Assets
FMA	Field Monitor Assistant
GBV	Gender-based violence
GDP	Gross domestic product
GEWE	Gender Equality and Women's Empowerment
GNR	Global Nutrition Report
GTNS	Gender Transformative and Nutrition Sensitive
GT-PAMRDC	Working Group for the National Multi-Sectoral Action Plan for the Reduction of Chronic Undernutrition)
HAZ	Height-for-age
HIV	Human Immunodeficiency Virus
HDI	Human Development Index
HDDS	Household Dietary Diversity Score
ICA	Integrated Context Analysis
ICRAF	International Centre for Research in Agroforestry/ World Agroforestry
IR	Inception Report
IPC	Integrated Phase Classification
MAD	Minimum Acceptable Diet
MAD-W	Minimum Acceptable Diet for Women
MAM	Moderate Acute Malnutrition
N	Observation or Sample size
NEGD	Non-equivalent Group Design
NGO	Non-Governmental Organization
ODK	Open Data Kit
PHL	Post-Harvest Loss
PMS	Propensity Score Matching
PRO-WEAI	Project Women Empowerment Agricultural Index
RB	Regional Bureau
SBCC	Social and Behaviour Change Communications
SDAE	District Services for Economic Activity
SDSMAS	District Services for Health, Women, and Social Action
SE	Standard Error
SDGs	Sustainable Development Goals
TEA	Technico Extensionista de Agricultura
ToR	Terms of Reference
UNDAF	United Nations Development Assistance Framework
UNICEF	United Nations Children's Fund

WAZ	Weight-for-age
WDI	World Development Indicators
WEAI	Women Empowerment Agricultural Index
WFP	World Food Program
WHO	World Health Organization
WHZ	Weight-for-height
2SLS	Two-stage Least Square

Annex 6: Number of Households Surveyed per Village

Intervention Village	Sample households	Control villages	Sampled households
Bangwe	9	Cado Sede	6
Nhasulu	16	Mitoto	7
Zenguerere	2	Nhabobobo	2
Bucha	8	Ntchena	8
Castela	4	Nhacaimbe 2	5
Fernando	7	Nhacalickhatiwe	5
Nhancaca/Xitenge	6	Nhamissadze	8
Andrassone	5	Nhacatondo	8
Cassume	7	Capanga	7
Nhacagulagua 1	7	Cawiwe 1	8
Nhacagulagua 2	4	Chindio	8
Nhkuiyoyo	3	Maswe	5
Tsera	5	Nguirande	8
Mandue	8	Djane 1	7
Melo 1	11	Djane 2	6
Melo 2	9	Nhansinde	6
Nhacavunvu	5	Thava	8
Nhapwete	5	Djequicene	7
Deve	4	Panzala	6
Francalino	6	Swinda	8
Mulima-sede	14	Leite 1	8
Nhangue	4	Leite 2	7
Niquice	10	Matope	8
Ofece	11	Nhambeu	8
Thenda	8	Nhabswimbira	8
Zomdane 1	5	Bairro chave	7
Zomdane 2	8	Bairro Jovem	9
Mateus/Nhansululue	4	Missirissire	8
Muandinhoza	9	Cnemba sede	2
Nhamazonde	10	Colofite	8
Nhatsetse	13	Correia	9
Tomucene 1	7	Catondo	5
Tomucene 2/Thimba	6	Nhabatua 1	7
Xavier	6	Nhabatua 2	8
Bhaumbha	1	Nhazemba 2	8
Dzunga 1	8	Ntunga	5
Dzunga 2	3	Nhacavungute	5
Nhalunga	5	Ndango	5
Nhambhandha	8	Alfinar	7
Nharugue	4	Bero 2	5
Shonsua	6	Goe sede	4
Arnelo	5	Nhambata	8
Candima	5	Estacha	8
Fumbe 1	8	Julinho	5
Fumbe 2	5	Mponha	8
Nhamaliwa	4	Nhacanfinzira 1	5
Nhamingale	6	Sossoto	5
		Macasado	5
		Nhatchetcha	8
Total	**314**		**326**

Note: Original target (instructions) was to survey eight households per village

Annex 7: Attitudes towards recommended practices (results for each practice)

As shown in Table A7.1, approximately 68% of women from the control group agree that a child with breathing difficulties is cause for concern compared to 57% of women in the intervention villages. Furthermore, 6% from the control group and 13% from the intervention group disagree with this statement, respectively. Women in the intervention villages are therefore slightly less likely be to have a positive attitude vis-à-vis this indicator.

Table A7.1: Mean difference in proportion of women's attitude to child breathing difficulty

Variable	Control[1] Mean (SE)	Intervention[2] Mean (SE)	diff (2-1) (SE)
Is the difficulty of breathing, with short, fast breaths, a sign of danger to a child?			
Agree	0.683	0.571	-0.112**
	(0.466)	(0.496)	(0.051)
Partially agree	0.157	0.156	-0.001
	(0.365)	(0.364)	(0.031)
Disagree	0.063	0.130	0.067**
	(0.244)	(0.337)	(0.033)
Don't know	0.097	0.143	0.046
	(0.296)	(0.351)	(0.030)
Observations	**326**	**314**	**640**

* p<0.1, ** p<0.05, *** p<0.01; standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in population across intervention and comparison villages

153. Table A7.2 compares women's attitudes to the use of contraceptives to facilitate child spacing. It is noteworthy that half of the women in both the intervention and control villages reported that they do not know when asked this question. For those that did have an option, those in the control villages were more likely to report having a positive one than those in the intervention villages. In particular, 10% of women in the intervention villages disagreed with the statement, as compared with 18% in the intervention villages.

Table A7.2: Mean difference in proportion of women with varying attitudes towards use of contraceptives for pregnancy spacing and its impact on mother's health and that of baby

Variable	Control[1] Mean (SE)	Intervention[2] Mean (SE)	diff (2-1) (SE)
The use of contraceptives for pregnancy spacing will likely improve your health and that of the baby?			
Agree	0.301	0.239	-0.062
	(0.459)	(0.427)	(0.047)
Partially agree	0.103	0.089	-0.015
	(0.305)	(0.285)	(0.030)
Disagree	0.096	0.183	0.087***
	(0.295)	(0.388)	(0.033)
I don't know	0.500	0.489	-0.011
	(0.501)	(0.501)	(0.061)
Observations	**326**	**314**	**640**

* p<0.1, ** p<0.05, *** p<0.01; standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in population across intervention and comparison villages

154. Table A7.3 presents and compares the proportions of women with varying attitude towards young woman's use of the family planning method. Just over half of women in both the intervention and control villages responded that they don't know when asked this question. For those that expressed having an option, approximately half agreed, and half disagreed, with not statistically significant differences between the intervention and control villages.

Table A7.3: Mean difference in proportion of women vis-à-vis attitudes to use of family planning method among young women

	Control (1)	Intervention (2)	
Variable	**Mean**	**Mean**	**Dif. (2-1)**
Can a young woman who has never been pregnant use a family planning method at no risk for her fertility?			
Agree	0.129	0.114	-0.015
	(0.336)	(0.318)	(0.031)
Partially agree	0.099	0.091	-0.008
	(0.299)	(0.288)	(0.030)
Disagree	0.220	0.275	0.055
	(0.415)	(0.447)	(0.052)
I don't know	0.552	0.520	-0.032
	(0.498)	(0.500)	(0.050)
Observations	**326**	**314**	**640**

* p<0.1, ** p<0.05, *** p<0.01; standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in population across intervention and comparison villages

155. Table A74 presents results for the respondent's attitudes towards early marriage. No statistically significantly differences between the intervention and control villages were identified. However, a slightly higher percentage of women in the control villages either agreed or partly agreed with the statement (44% versus 34%). Over one-third of women in both villages reported that they did not know.

Table A7.4: Mean difference in proportion of women vis-à-vis attitudes to early marriage and its negative consequences

	Control (1)	Intervention (2)	
Variable	**Mean**	**Mean**	**Dif. (2-1)**
Getting married before 18 years brings negative consequences for girls?			
Agree	0.326	0.264	-0.062
	(0.470)	(0.442)	(0.048)
Partially agree	0.112	0.078	-0.034
	(0.316)	(0.269)	(0.030)
Disagree	0.187	0.242	0.055
	(0.390)	(0.429)	(0.040)
I don't	0.375	0.416	0.041
	(0.485)	(0.494)	(0.043)
Observations	**326**	**314**	**640**

* p<0.1, ** p<0.05, *** p<0.01; standard errors in parentheses and clustered at village level; sampling weights used to adjust for differences in population across intervention and comparison villages

Annex 8: Supplementary anthropometric tables and graphs

Table A8.1: Prevalence of stunting, wasting and undernourishment for children 6 to 59 months

	Children aged 6-59 months								
	Pooled			Females			Males		
	Control[1]	Treatment[2]	Diff	Control[3]	Treatment[4]	Diff	Control[5]	Treatment[6]	Diff
Variable	Mean	Mean	(2)-(1)	Mean	Mean	(4)-(3)	Mean	Mean	(6)-(5)
Height-for-age (HAZ)									
Stunting	0.372	0.391	0.019	0.346	0.359	0.013	0.396	0.419	0.024
	(0.484)	(0.489)	(0.577)	(0.477)	(0.481)	(0.785)	(0.490)	(0.494)	(0.640)
Moderate stunting	0.216	0.282	0.066**	0.206	0.224	0.018	0.225	0.333	0.109**
	(0.412)	(0.450)	(0.022)	(0.405)	(0.418)	(0.633)	(0.418)	(0.472)	(0.012)
Severe stunting	0.156	0.109	-0.047**	0.140	0.136	-0.005	0.171	0.086	-0.085***
	(0.364)	(0.312)	(0.018)	(0.348)	(0.343)	(0.887)	(0.377)	(0.281)	(0.008)
Weight-for-age (WAZ)									
Underweight	0.249	0.222	-0.028	0.205	0.234	0.030	0.290	0.210	-0.080
	(0.433)	(0.416)	(0.432)	(0.404)	(0.425)	(0.492)	(0.455)	(0.408)	(0.105)
Moderate underweight	0.183	0.164	-0.019	0.144	0.179	0.035	0.219	0.150	-0.069
	(0.387)	(0.371)	(0.517)	(0.352)	(0.385)	(0.344)	(0.414)	(0.358)	(0.106)
Severe underweight	0.066	0.058	-0.008	0.060	0.055	-0.005	0.071	0.060	-0.011
	(0.249)	(0.233)	(0.651)	(0.238)	(0.228)	(0.855)	(0.258)	(0.238)	(0.647)
Weight-for-height (WHZ)									
Wasting	0.087	0.055	-0.032*	0.082	0.050	-0.032	0.091	0.059	-0.032
	(0.282)	(0.227)	(0.095)	(0.275)	(0.218)	(0.202)	(0.288)	(0.236)	(0.211)
Moderate wasting	0.081	0.041	-0.041**	0.076	0.030	-0.046**	0.085	0.050	-0.036
	(0.273)	(0.197)	(0.017)	(0.266)	(0.172)	(0.028)	(0.280)	(0.218)	(0.136)
Severe wasting	0.006	0.014	0.008	0.006	0.019	0.014	0.006	0.009	0.004
	(0.075)	(0.118)	(0.305)	(0.075)	(0.138)	(0.337)	(0.075)	(0.096)	(0.605)
Overweight	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	()	(0.000)	(0.000)	()	(0.000)	(0.000)	()
Obesity	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	()	(0.000)	(0.000)	()	(0.000)	(0.000)	()
Mid-Upper Arm Circumference (MUAC)									
Global acute malnutrition	0.123	0.081	-0.042	0.178	0.083	-0.095**	0.072	0.080	0.007
	(0.329)	(0.273)	(0.129)	(0.383)	(0.276)	(0.010)	(0.259)	(0.271)	(0.833)
Moderate acute malnutrition	0.106	0.068	-0.037	0.146	0.066	-0.080**	0.069	0.070	0.002
	(0.308)	(0.253)	(0.143)	(0.353)	(0.249)	(0.016)	(0.254)	(0.256)	(0.965)
Severe acute malnutrition	0.012	0.008	-0.004	0.026	0.007	-0.019	0.000	0.009	0.009*
	(0.110)	(0.090)	(0.597)	(0.158)	(0.082)	(0.215)	(0.000)	(0.096)	(0.093)
Observations	**511**	**486**	**997**	**244**	**235**	**479**	**267**	**251**	**518**

Notes: Stunted children include both moderately and severely stunted children. Wasted children are the sum of moderately and severely wasted children. Underweight children also include the sum of moderately and severely underweight children. The value displayed for t-tests are the differences in the means across the groups. Standard errors are clustered at variable *vil code*. Observations are weighted using variable *vil weight* as pweight. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level, respectively

Table A8.2: Prevalence of stunting, wasting and undernourishment in control sample area by gender

	Control sample								
	Pooled			Children aged 6 to 23 months			Children aged 24 to 59 months		
	Female[1]	Male[2]	Diff	Female[3]	Male[4]	Diff	Female[5]	Male[6]	Diff
Variable	Mean	Mean	(2)-(1)	Mean	Mean	(4)-(3)	Mean	Mean	(6)-(5)
Height-for-age (HAZ)									
Stunting	0.346	0.396	0.050	0.262	0.398	0.136***	0.494	0.389	-0.105
	(0.477)	(0.490)	(0.267)	(0.441)	(0.491)	(0.005)	(0.503)	(0.491)	(0.215)
Moderate stunting	0.206	0.225	0.019	0.158	0.238	0.079	0.290	0.190	-0.099
	(0.405)	(0.418)	(0.622)	(0.366)	(0.427)	(0.102)	(0.456)	(0.395)	(0.190)
Severe stunting	0.140	0.171	0.031	0.104	0.160	0.056	0.205	0.199	-0.006
	(0.348)	(0.377)	(0.409)	(0.306)	(0.368)	(0.156)	(0.405)	(0.402)	(0.940)
Weight-for-age (WAZ)									
Underweight	0.205	0.290	0.085**	0.191	0.307	0.116**	0.229	0.246	0.017
	(0.404)	(0.455)	(0.033)	(0.394)	(0.462)	(0.010)	(0.422)	(0.433)	(0.816)
Moderate underweight	0.144	0.219	0.074**	0.130	0.228	0.098**	0.170	0.194	0.024
	(0.352)	(0.414)	(0.034)	(0.337)	(0.420)	(0.015)	(0.378)	(0.398)	(0.703)
Severe underweight	0.060	0.071	0.011	0.061	0.079	0.018	0.059	0.052	-0.007
	(0.238)	(0.258)	(0.584)	(0.240)	(0.270)	(0.534)	(0.236)	(0.223)	(0.871)
Weight-for-height (WHZ)									
Wasting	0.082	0.091	0.009	0.099	0.114	0.015	0.053	0.032	-0.021
	(0.275)	(0.288)	(0.696)	(0.299)	(0.318)	(0.643)	(0.224)	(0.177)	(0.440)
Moderate wasting	0.076	0.085	0.009	0.090	0.106	0.016	0.053	0.032	-0.021
	(0.266)	(0.280)	(0.692)	(0.287)	(0.308)	(0.616)	(0.224)	(0.177)	(0.440)
Severe wasting	0.006	0.006	-0.000	0.009	0.008	-0.001	0.000	0.000	0.000
	(0.075)	(0.075)	(0.999)	(0.094)	(0.089)	(0.902)	(0.000)	(0.000)	()
Overweight	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	()	(0.000)	(0.000)	()	(0.000)	(0.000)	()
Obesity	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	()	(0.000)	(0.000)	()	(0.000)	(0.000)	()
Mid-Upper Arm Circumference (MUAC)									
Global acute malnutrition	0.178	0.072	-0.106***	0.256	0.100	-0.157***	0.039	0.000	-0.039*
	(0.383)	(0.259)	(0.000)	(0.438)	(0.300)	(0.000)	(0.195)	(0.000)	(0.055)
Moderate acute malnutrition	0.146	0.069	-0.077***	0.211	0.095	-0.116***	0.030	0.000	-0.030*
	(0.353)	(0.254)	(0.003)	(0.409)	(0.294)	(0.004)	(0.172)	(0.000)	(0.096)
Severe acute malnutrition	0.026	0.000	-0.026*	0.040	0.000	-0.040*	0.000	0.000	0.000
	(0.158)	(0.000)	(0.079)	(0.196)	(0.000)	(0.073)	(0.000)	(0.000)	()
Observations	**244**	**267**	**511**	**165**	**198**	**363**	**79**	**69**	**148**

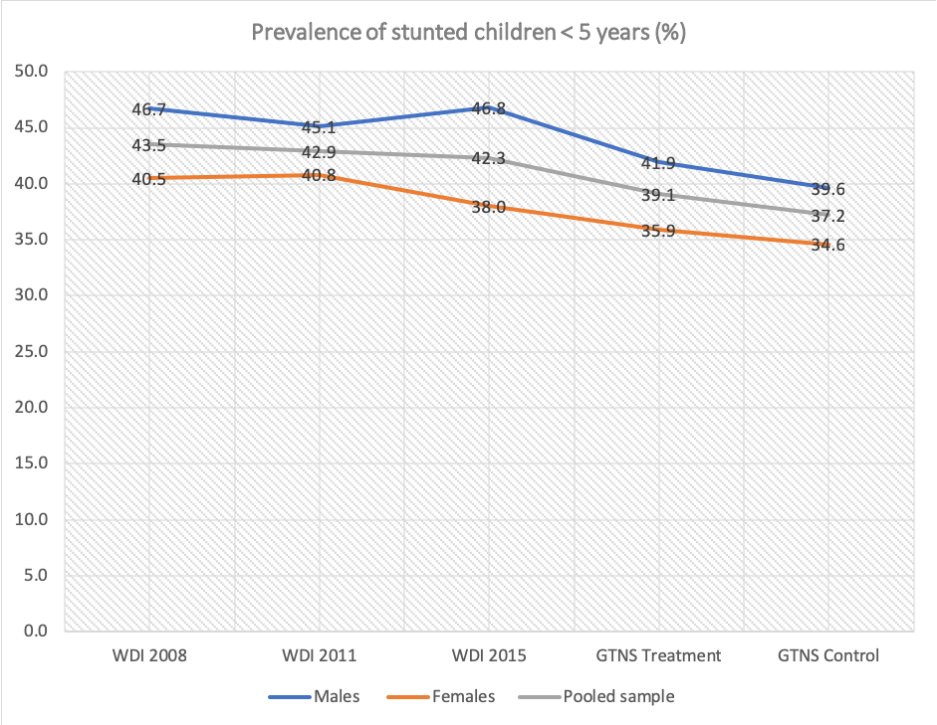
Notes: Stunted children include both moderately and severely stunted children. Wasted children are the sum of moderately and severely wasted children. Underweight children also include the sum of moderately and severely underweight children. The value displayed for t-tests are the differences in the means across the groups. Standard errors are clustered at variable vil code. Observations are weighted using variable vil weight as pweight. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level, respectively

Table A8.3: Prevalence of stunting, wasting and undernourishment in treatment sample by gender

	Treatment sample								
	Pooled			Children aged 6 to 23 months			Children aged 24 to 59 months		
	Female[1]	Male[2]	Diff	Female[3]	Male[4]	Diff	Female[5]	Male[6]	Diff
Variable	Mean/SE	Mean/SE	(2)-(1)	Mean/SE	Mean/SE	(4)-(3)	Mean/SE	Mean/SE	(6)-(5)
Height-for-age (HAZ)									
Stunting	0.359	0.419	0.060	0.250	0.396	0.145**	0.569	0.454	-0.114
	(0.481)	(0.494)	(0.304)	(0.435)	(0.491)	(0.041)	(0.499)	(0.500)	(0.180)
Moderate stunting	0.224	0.333	0.109**	0.157	0.296	0.139**	0.352	0.389	0.037
	(0.418)	(0.472)	(0.020)	(0.365)	(0.458)	(0.022)	(0.481)	(0.490)	(0.641)
Severe stunting	0.136	0.086	-0.050	0.093	0.100	0.007	0.217	0.065	-0.151*
	(0.343)	(0.281)	(0.201)	(0.291)	(0.301)	(0.879)	(0.415)	(0.248)	(0.051)
Weight-for-age (WAZ)									
Underweight	0.234	0.210	-0.024	0.207	0.281	0.074	0.288	0.107	-0.181**
	(0.425)	(0.408)	(0.615)	(0.406)	(0.451)	(0.191)	(0.456)	(0.310)	(0.046)
Moderate underweight	0.179	0.150	-0.029	0.162	0.184	0.022	0.213	0.100	-0.112
	(0.385)	(0.358)	(0.492)	(0.370)	(0.389)	(0.662)	(0.412)	(0.302)	(0.192)
Severe underweight	0.055	0.060	0.005	0.045	0.097	0.052	0.075	0.006	-0.069
	(0.228)	(0.238)	(0.878)	(0.207)	(0.296)	(0.256)	(0.265)	(0.079)	(0.157)
Weight-for-height (WHZ)									
Wasting	0.050	0.059	0.009	0.056	0.099	0.043	0.037	0.000	-0.037
	(0.218)	(0.236)	(0.704)	(0.231)	(0.300)	(0.254)	(0.190)	(0.000)	(0.118)
Moderate wasting	0.030	0.050	0.019	0.027	0.084	0.057*	0.037	0.000	-0.037
	(0.172)	(0.218)	(0.325)	(0.163)	(0.278)	(0.066)	(0.190)	(0.000)	(0.118)
Severe wasting	0.019	0.009	-0.010	0.029	0.016	-0.014	0.000	0.000	0.000
	(0.138)	(0.096)	(0.463)	(0.169)	(0.124)	(0.507)	(0.000)	(0.000)	()
Overweight	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	()	(0.000)	(0.000)	()	(0.000)	(0.000)	()
Obesity	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	()	(0.000)	(0.000)	()	(0.000)	(0.000)	()
Mid-Upper Arm Circumference (MUAC)									
Global acute malnutrition	0.083	0.080	-0.003	0.118	0.113	-0.005	0.015	0.032	0.016
	(0.276)	(0.271)	(0.936)	(0.324)	(0.317)	(0.920)	(0.124)	(0.176)	(0.642)
Moderate acute malnutrition	0.066	0.070	0.005	0.092	0.097	0.005	0.015	0.032	0.016
	(0.249)	(0.256)	(0.901)	(0.290)	(0.297)	(0.928)	(0.124)	(0.176)	(0.642)
Severe acute malnutrition	0.007	0.009	0.002	0.010	0.016	0.005	0.000	0.000	0.000
	(0.082)	(0.096)	(0.743)	(0.102)	(0.124)	(0.657)	(0.000)	(0.000)	()
Observations	**235**	**251**	**486**	**164**	**166**	**330**	**71**	**85**	**156**

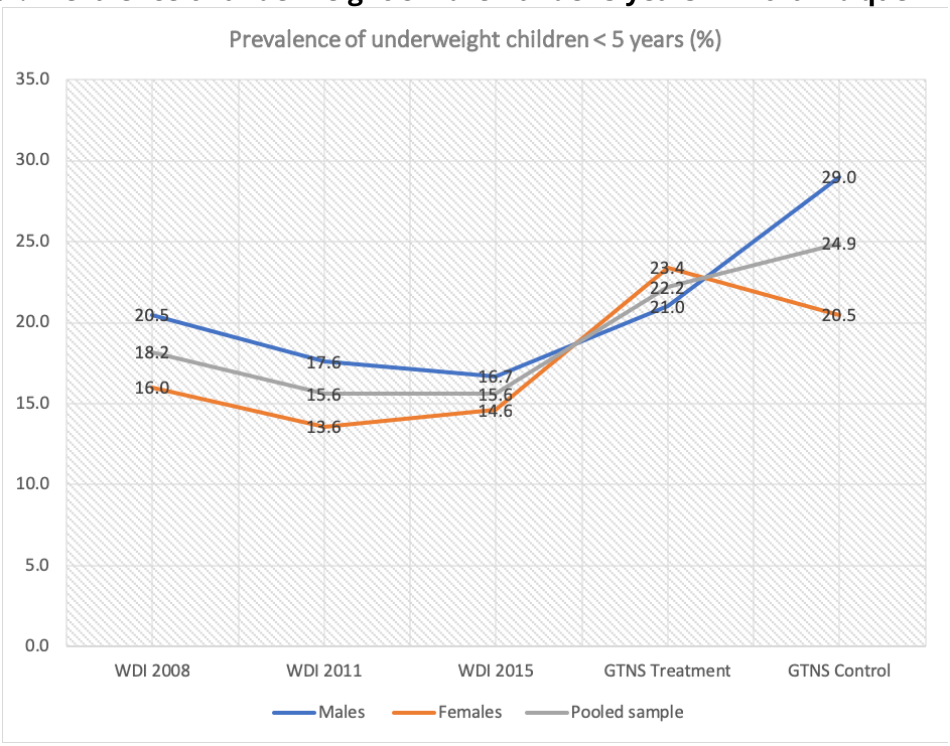
Notes: Stunted children include both moderately and severely stunted children. Wasted children are the sum of moderately and severely wasted children. Underweight children also include the sum of moderately and severely underweight children. The value displayed for t-tests are the differences in the means across the groups. Standard errors are clustered at variable *vil code*. Observations are weighted using variable *vil weight* as pweight. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level, respectively.

Figure A8.1: Prevalence of stunting among children under 5 years in Mozambique



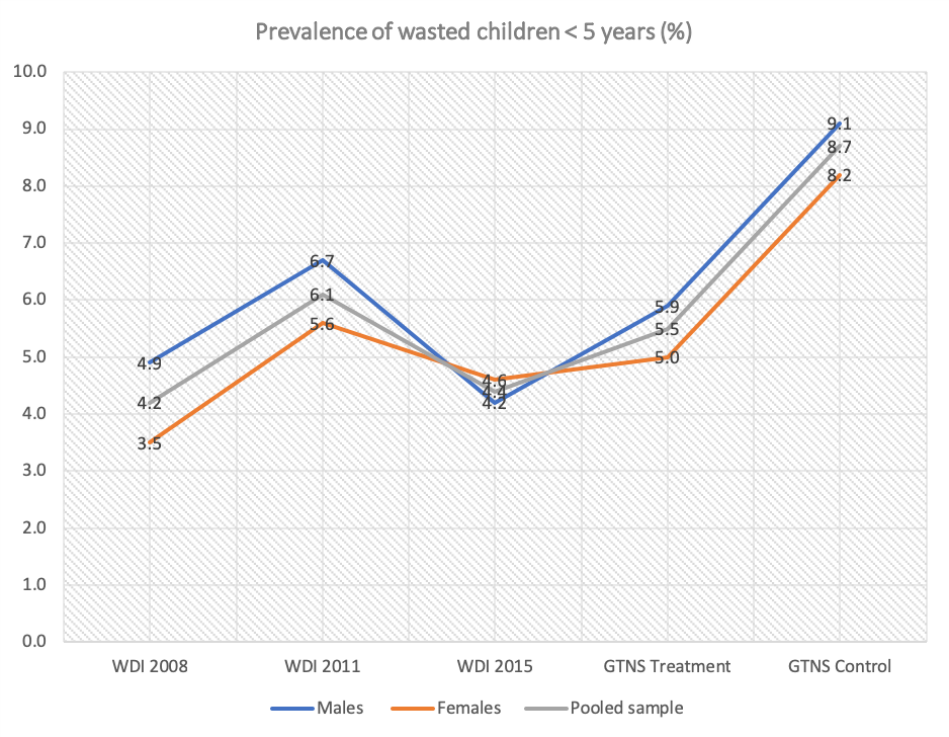
Notes: World Development Indicators (WDI) are estimates of child malnutrition (0-59months), from Mozambique, based on national survey data harmonized by UNICEF, WHO, and the World Bank for the year 2008, 2011 and 2015 (UNICEF et al., 2016). GTNS estimates based on anthropometric data from 997 children collected in a baseline survey in 2020 in Chemba district in Mozambique.

Figure A8.2: Prevalence of underweight children under 5 years in Mozambique



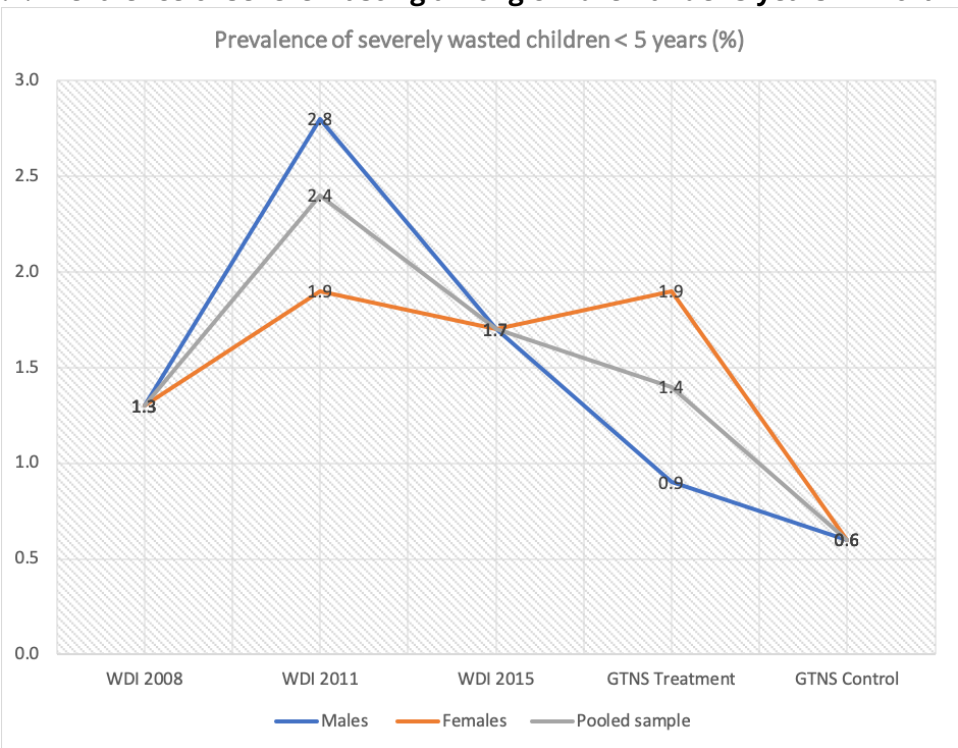
Notes: World Development Indicators (WDI) are estimates of child malnutrition (0-59months), from Mozambique, based on national survey data harmonized by UNICEF, WHO, and the World Bank for the year 2008, 2011 and 2015 (UNICEF et al., 2016). GTNS estimates based on anthropometric data from 997 children collected in a baseline survey in 2020 in Chemba district in Mozambique.

Figure A8.3: Prevalence of wasted children under 5 years in Mozambique



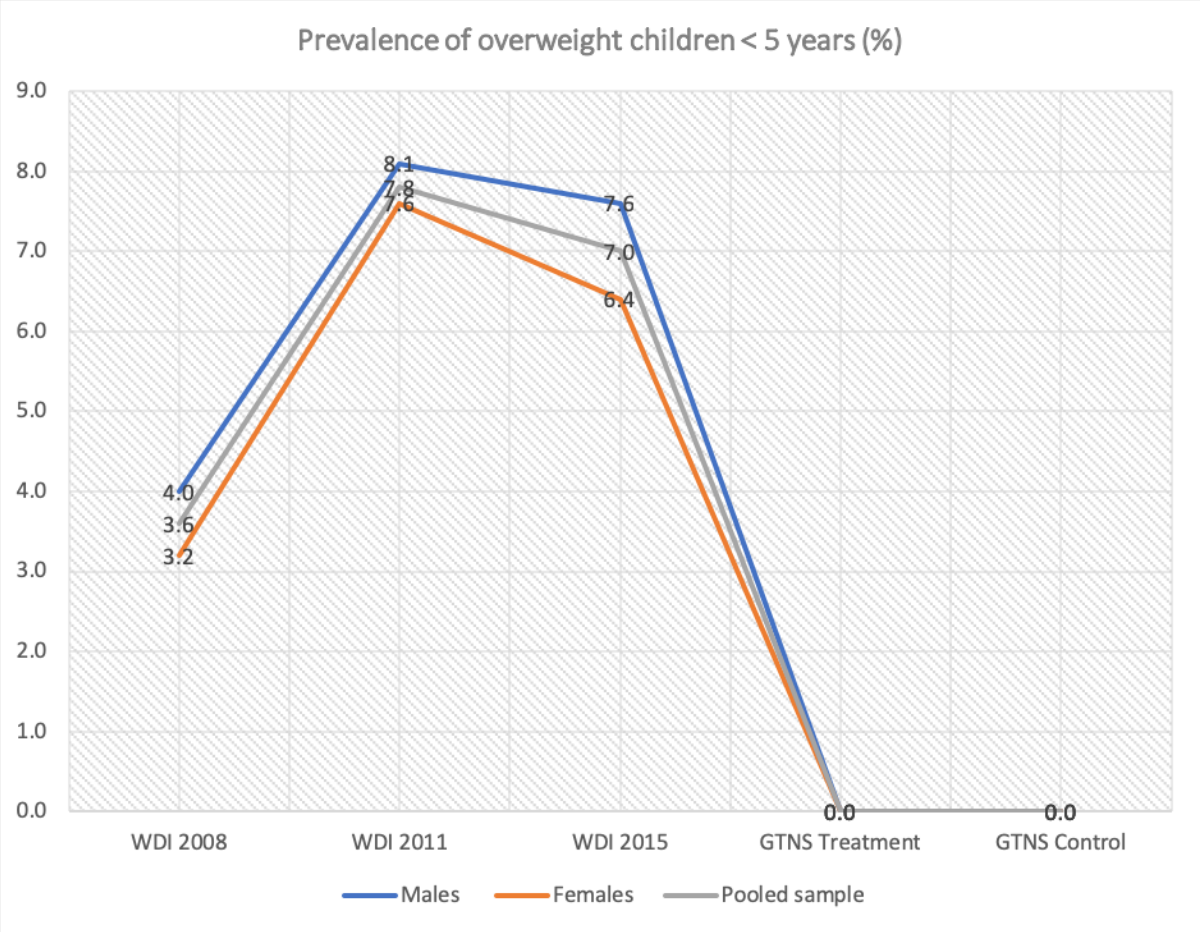
Notes: World Development Indicators (WDI) are estimates of child malnutrition (0-59months), from Mozambique, based on national survey data harmonized by UNICEF, WHO, and the World Bank for the year 2008, 2011 and 2015 (UNICEF et al., 2016). GTNS estimates based on anthropometric data from 997 children collected in a baseline survey in 2020 in Chemba district in Mozambique.

Figure A8.4: Prevalence of severe wasting among children under 5 years in Mozambique



Notes: World Development Indicators (WDI) are estimates of child malnutrition (0-59months), from Mozambique, based on national survey data harmonized by UNICEF, WHO, and the World Bank for the year 2008, 2011 and 2015 (UNICEF et al., 2016). GTNS estimates based on anthropometric data from 997 children collected in a baseline survey in 2020 in Chemba district in Mozambique.

Figure A8.5: Prevalence of overweight children under 5 years in Mozambique



Notes: World Development Indicators (WDI) are estimates of child malnutrition (0-59months), from Mozambique, based on national survey data harmonized by UNICEF, WHO, and the World Bank for the year 2008, 2011 and 2015 (UNICEF et al., 2016). GTNS estimates based on anthropometric data from 997 children collected in a baseline survey in 2020 in Chemba district in Mozambique.

Annex 9: Detailed project components and budget

Intervention Logic

GTNS's impact pathway reflects international policy and guidance which posits that to achieve a reduction in stunting multi-sectoral, multi-stakeholder programming is required. WFP, with its expertise in food security and nutrition, will focus on a nutrition-sensitive project that spans across agriculture, gender, health, and WASH sectors, thus, simultaneously targeting multiple underlying drivers of malnutrition **(**see Figure 2 Project Impact Pathway).

Project Impact Pathway

The project will empower women and adolescent girls and contribute to stunting reduction of girls and boys under-five which is a long-term objective of the Government's Five-Year Programme (PQG) 2015-2019 and supported by WFP Mozambique's Country Strategic Plan 2017-2021 (see Figure 2 for project impact pathway). The PQG is further supported by the prioritization of stunting reduction under the National Multi-sectoral Action Plan for the Reduction of Chronic Malnutrition, (PAMRDC), 2011-2020 and the Food Security and Nutrition Strategy 2008 – 2015 (see figure 2 in page 7).[96]

Target group:

The total number of primary beneficiaries are 1,500 households (7,500 individuals) including at least 500 pregnant women, 500 adolescent girls, and 750 children under two-years old. The secondary beneficiaries are 5,000 households (25,000 community members) via SBCC activities.

Targeting of primary beneficiaries will focus on the first 1,000 days, from conception until a child turns two years old as this is the internationally recognized window of opportunity to impact stunting. Therefore, the project will target vulnerable households that meet the below criteria[97]:

Households with a pregnant woman or; a child under two-years of age or; an adolescent girl; or a woman with obstetric fistula[98]

The secondary beneficiaries of the programme include:

- 208 Community Health Workers (138 men and 70 women) trained on optimal dietary diversity practices and family planning and engaged in demand generation for nutritious foods, sexual and reproductive health services, and basic childhood health services
- 40 lead farmers (36 men and 4 women) trained on post-harvest management and technology and optimal dietary diversity practices
- At least 2 agro-dealers engaged to provide hermetic storage products at community level
- At least 1 community radio station and its staff engaged in the project to deliver messages and programmes on dietary diversity, the negative impacts of early marriage, the positive impacts of accessing SRH and basic childhood health services, and post-harvest loss technologies using multiple methods including talk shows, debates, and dramatic series

[96] The Food Security and Nutrition Strategy 2008-2015 is still valid. It has been revised and is awaiting official endorsement and will be valid from 2020-2030.

[97] Inter-household targeting will give preference to households that match the target criteria and have disabled members, chronically ill family members, elderly with responsibility for children, female-head households and child-headed households.

[98] Based upon discussion with UNFPA obstetric fistula is included as its own category as it disproportionately affects adolescent mothers, leads to social isolation, and poor quality of life. These women are often turned away for surgery if they are not 'strong' enough and require the benefit of food assistance

- At least 5,000 households (25,000 individuals) benefit from SBCC activities on received messages on dietary diversity, the negative impacts of early marriage, the positive impacts of accessing SRH and basic childhood health services, and post-harvest loss technologies using multiple methods including talk shows, debates, and dramatic series

Detailed Component Breakdown

1. Food Assistance for Assets (FFA)

Food Basket Distributions in parallel to gender and nutrition-sensitive assets established at community and household level to increase access to a diverse variety of foods, including animal source proteins, and to contribute to climate risk management. The activities to be undertaken for each FFA implementation phase:

Implementing partner: **World Vision**

- Standard food basket distributions
- Household asset creation comprised of a standard package of gender and nutrition sensitive assets
- Community asset creation based on participatory planning processes to select nutrition-sensitive community assets
- Social and behaviour change communication for improved dietary diversity

2. Post-Harvest Loss Technology (PHL)

Appropriate technologies adopted by smallholder women and men farmers to reduce post-harvest losses and increase food availability.

Implementing partners: **- community lead farmers,**
- HELVETAS and
- District Services for Economic Activity

- Conducting Post Harvest Losses trainings, including food processing, conservation, and storage
- Demand generation for adoption of post-harvest losses technologies

3. Social and Behaviour Change Communication (SBCC)

Social and Behaviour Change Communication strategy implemented to increase and improve knowledge, attitudes, and practices related to early marriage, sexual and reproductive health, nutrition and care, and basic childhood illnesses. The SBCC component is implemented by Pathfinder International and PCI Media in coordination with the district health authorities (SDSMAS).

Pathfinder in coordination with SDSMAS will be implementing:

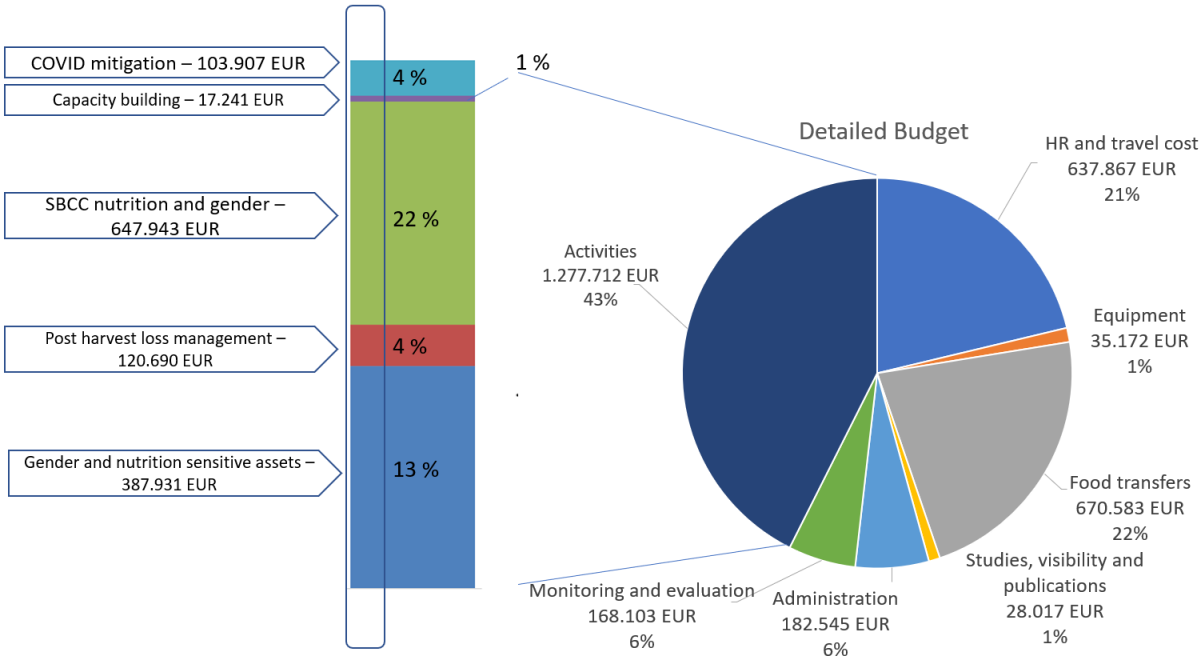
- Interpersonal messages and education provided by community health activists and referrals to key health services for sexual and reproductive health and childhood illnesses
- Community dialogue clubs conducted related to gender equality and women's empowerment, thematic areas will include gender roles and norms, household decision making, examining power dynamics, early marriage, family planning, and maternal, infant and young child nutrition among other topics to be selected with the community

PCI Media will be implementing

- Community radio transmits of radio spots, live debates, and dramatic programmes

Budget Division for Components

From the 3.000.000 EUR granted to the 2.5 year project, the division amongst the different components are as follows:



References:

Black et al (2013). Maternal and child undernutrition and overweight in low-income and middle-income countries. Lancet 2013; 382: 427-451.

Daniel, J. B., Pinto, E., Queiroz, V. de O., & Oliveira, A. M. de. (2019). The Determinants of Anthropometric Deficits in Children under Five Years Old in Tete Province Mozambique Using Hierarchy Approach. *Open Journal of Epidemiology*. https://doi.org/10.4236/ojepi.2019.91002

Development Initiatives (2017). Global Nutrition Report 2017: Nourishing the SDGs. Bristol, UK: Development Initiatives.

FANRPAN (2014) Towards a Specific Post-harvest Loss Management Policy and Strategy for Mozambique, Policy Brief. Retrieved from https://www.fanrpan.org/sites/default/files/publications/Mozambique_PHM_Policy_Brief.pdf

Famine Early Warning Systems Network (FEWS NET) (2018). Mozambique Food Security Outlook December 2018 to May 2019

FANTA 2002, Washington DC. (available at: https://core.ac.uk/download/pdf/6289355.pdf)

FANTA. (2016). Nutrition Assessment and Classification. *Nutrition Assessment, Counseling, and Support (NACS)*, *1*(1), 12. Retrieved from https://www.fantaproject.org/sites/default/files/resources/NACS-Users-Guide-Module2-May2016.pdf

Goldstein, N. J., Cialdini, R. B., & Griskevicius, V. (2008). A Room with a Viewpoint: Using Social Norms to Motivate Environmental Conservation in Hotels. Journal of Consumer Research, 35(3), 472–482. https://doi.org/10.1086/586910

García Cruz, L. M., González Azpeitia, G., Reyes Súarez, D., Santana Rodríguez, A., Loro Ferrer, J. F., & Serra-Majem, L. (2017). Factors associated with stunting among children aged 0 to 59 months from the central region of Mozambique. *Nutrients*. https://doi.org/10.3390/nu9050491

GSARS (2018) Guidelines on the measurement of harvest and post-harvest losses Recommendations on the design of a harvest and post-harvest loss statistics system for food grains (cereals and pulses), retrieved 18 May 2020 at http://www.fao.org/fsnforum/resources/fsn-resources/guidelines-how-measure-harvest-and-post-harvest-losses

Hoddinott, J. & Yohannes, Y. 2002. Dietary diversity as a food security indicator. FANTA 2002, Washington DC. (available at: https://core.ac.uk/download/pdf/6289355.pdf)

Kabeer, N. (1999). Resources, agency, achievements: Reflections on the measurement of women's empowerment. Development and Change, 30(3), 435–464. https://doi.org/10.1111/1467-7660.00125.

Malapit et al. (2019) Development of the project-level Women's Empowerment in Agriculture Index (pro-WEAI), World Development, https://doi.org/10.1016/j.worlddev.2019.06.018.

Moser, C., & Dani, A. (Ed.) (2008). Assets and Livelihoods: a Framework for Asset-Based Social Policy. In *Assets, Livelihoods and Social Policy* World Bank

Muriel, et al (2015), "Mozambique, 200286 Country Programme: An Evaluation of WFP's Operation (2012-2015): Operation Evaluation", World Food Programme, Office of Evaluation, Rome -Italy

Nhampossa, T., Sigaúque, B., MacHevo, S., MacEte, E., Alonso, P., Bassat, Q., … Fumadó, V. (2013). Severe malnutrition among children under the age of 5 years admitted to a rural district hospital in southern Mozambique. *Public Health Nutrition*. https://doi.org/10.1017/S1368980013001080

Tanya Khara and Carmel Dolan (2014). Technical briefing paper: The relationship between wasting and stunting, policy, programming and research implications.

Documents Reviewed

African Union (AU), NEPAD, World Food Program (WFP), & ECLAC. (2017). Estudo do Custo da Fome em Africa: Impacto Social e Econômico Desnutrição em Crianças em Moçambique: Impacto Social e Económico da Desnutrição Infantil no Desenvolvimento a Longo Prazo de Moçambique a Longo Prazo. Maputo.
Development Initiatives (2017). Global Nutrition Report 2017: Nourishing the SDGs. Bristol, UK: Development Initiatives.
Famine Early Warning Systems Network (FEWS NET) (2018). Mozambique Food Security Outlook December 2018 to May 2019
ICRAF (2019). Proposal for WFP Mozambique: Baseline survey GTNS
ICRAF, ELIM & WFP (2020). Assessing the nutritional, social and economic impacts of the Mozambique Gender Transformative and Nutrition
Sensitive (GTNS) Programme (2019 to 2021): Baseline Survey Protocol.
International Food Policy Research Institute (IFPRI) (2015). Climate Change and Nutrition, chapter 6 in Global Nutrition Report 2015: Actions and Accountability to Advance Nutrition and Sustainable Development. Washington, DC.
International Food Policy Research Institute. (2016). Global Nutrition Report 2016: from promise to impact: ending malnutrition by 2030. Washington, D.C
Instituto Nacional de Estatística (INE) (2013). Mozambique 2013 Statistical Yearbook, Maputo, Mozambique.
IOF (2015) Estimativas e Perfil da Pobreza em Moçambique: Uma Analise Baseada no Inquérito sobre Orçamento Familiar. Direcção de Estudos Económicos e Financeiros (DEEF), Ministério de Economia e Finanças (MEF), Maputo, Mozambique.
Technical Secretariat for Food Security and Nutrition (SETSAN) (2013). Baseline Survey for Food Security and Malnutrition. Maputo.
UN Committee on the Elimination of Discrimination against Women (2018). Combined third to fifth periodic reports submitted by Mozambique under article 18 of the Convention, due in 2014. Retrieved October 21, 2020, from https://tbinternet.ohchr.org/_layouts/15/treatybodyexternal/Download.aspx?symbolno=CEDAW/C/MOZ/3-5&Lang=en
Technical Secretariat for Food Security and Nutrition (SETSAN) (2018). Integrated Phase Classification (IPC) for Chronic Food Insecurity
UNDP (2018), Human Development Report, retrieved on 26 September 2018 form http://hdr.undp.org/en/composite/GII.
UNICEF, WHO, & WB. (2016). Joint child malnutrition estimates (JME). Retrieved June 1, 2020, from http://data.worldbank.org/data-catalog/world-development-indicators
UNICEF, WHO, & WB. (2016). Joint child malnutrition estimates (JME). Retrieved June 1, 2020, from http://data.worldbank.org/data-catalog/world-development-indicators
UNSCN. (2014). Findings from a review of country level programming in nutrition-sensitive agriculture. Available as of 04 July 2020 at: http://www.unscn.org/files/Publications/Review-country-level-programming-nutrition-sensitive_agriculture-UNSCN.pdf
WFP (2019). Terms of Reference EVALUATION of Mozambique Gender Transformative and Nutrition Sensitive (GTNS) Programme (2019 to 2021): Activity Evaluation, WFP Mozambique Country Office. Maputo.
WHO. (2006). WHO Child Growth Standards based on length/height, weight and age. Acta Paediatrica, International Journal of Paediatrics, 95(SUPPL. 450), 76–85; De Onis, M., Borghi, E., Arimond, M., Webb, P., Croft, T., Saha, K., … Flores-Ayala, R. (2019). Prevalence thresholds for wasting, overweight and stunting in children under 5 years. Public Health Nutrition, 22(1), 175–179.
WHO. (2006). WHO Child Growth Standards based on length/height, weight and age. Acta Paediatrica, International Journal of Paediatrics, 95(SUPPL. 450), 76–85. https://doi.org/10.1080/08035320500495548
WHO. (2006). WHO Child Growth Standards based on length/height, weight and age. Acta Paediatrica, International Journal of Paediatrics, 95(SUPPL. 450), 76–85. https://doi.org/10.1080/08035320500495548
WHO. (2006). WHO Child Growth Standards based on length/height, weight and age. Acta Paediatrica, International Journal of Paediatrics, 95(SUPPL. 450), 76–85. https://doi.org/10.1080/08035320500495548.
WHO. (2014). Global targets 2025. To improve maternal, infant and young child nutrition. Geneva: World Health Organization (WHO).
WHO. (2014). WHA Global Nutrition Targets 2025: Stunting Policy Brief. Rome: World Health Organization (WHO). https://doi.org/WHO/NMH/NHD/14.3
WHO. (2017). Global Database on Child Growth and Malnutrition: Mozambique. Retrieved October 12, 2017, from http://www.who.int/nutgrowthdb/database/countries/moz/en/
WHO. (2019). Essential nutrition actions: mainstreaming nutrition through the life-course. World Health Organization.
WHO. (2019). Essential nutrition actions: mainstreaming nutrition through the life-course. World Health Organization.
WHO. Global health estimates 2015: deaths by cause, age, sex, by country and by region, 2000–2015. Geneva: WHO; 2016.
World Bank. (2017). Mozambique Overview. Retrieved October 10, 2017, from http://www.worldbank.org/en/country/mozambique/overview

WFP Maputo, Mozambique
https://www.wfp.org/countries/mozambique