Research and Learning of the McGovern-Dole School Meals Program in Africa

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Acronyms

AAH.....Action Against Hunger
AGRA.....Alliance for Green Revolution in Africa
AIR.....Africa Improved Foods
ARED.....Associates in Research and Education for Development
CBNP.....Community Based Nutrition Programs
CCD.....Cost per Child per Day
CFSVA.....Comprehensive Food Security and Vulnerability Analysis
CPI.....Counterpart International
CRS.....Catholic Relief Services
CSB+.....Corn Soy Blend
CVA.....Citizen Voice and Action
DCAS.....The School Feeding Office
DEO.....District Education Officers
DER.....Daily Energy Requirements
DRI.....Dietary Reference Intakes
ECCD.....Early Childhood Care and Development
ECD.....Early Childhood Development Centers
EDPRS.....Economic Development and Poverty Reduction Strategy
EGRA.....Early Grade Reading Activity
FAO.....Food and Agriculture Organization of the United Nations
FBF.....Fortified Blended Food
FDC.....Forward Delivery Contracts
FFE.....Food for Education and Child Nutrition Program
FO.....Farmer Organizations
FR.....Faso Riibo
FTC.....Feed the Children
FTMA.....Farm to Market Alliance
GAP.....Good Agricultural Practices
GHI.....Gardens for Health International
HGSF.....Home Grown School Feeding
HGSMP.....Home Grown School Meals Programme
IOM.....Institute of Medicine
IYCF.....Infant and Young Child Feeding
IYCN.....Infant and Young Child Feeding Programs
KESSP.....Kenya Education Sector Support Program
LEAP.....Local Education Assistance and Procurement
LRP.....Local and Regional Food Aid Procurement
MAR.....Mean Adequacy Ratio

Acronyms

MC.....Municipal Council
MDD-W.....Minimum Dietary Diversity for Women
MDD.....Minimum Dietary Diversity
MDDS.....Minimum Dietary Diversity Score
MGD.....McGovern-Dole
MIECOFIN.....Ministry of Finance and Economic Planning
MINAGRI.....Ministry of Agriculture
MINALOC.....Ministry of Local Government
MINEDU.....Ministry of Education
MINICOM.....Ministry of Trade and Industry
MINIFRA.....Ministry of Infrastructure
MoEVT.....Ministry of Education and Vocational Training
MOH.....Ministry of Health
MoHCDGEC.....Ministry of Health, Community Development, Gender, Elderly and Children
MSU.....Mississippi State University
NCD.....Non-communicable diseases
NCSFP.....National Comprehensive School Feeding Policy
NECDP.....National Early Childhood Development Programme
NISR.....National Institute of Statistics of Rwanda
NMNAP.....National Multi-Sectoral Nutrition Action Plan
NNP.....National Nutrition Policy
NOC.....Nutrition Oversight Committees
NSFSC.....National School Feeding Steering Committee
NSGRP.....National Strategy for Growth and Reduction of Poverty
NSGRP II.....National Strategy for Growth and Reduction of Poverty II
NST.....National Strategy for Transformation
PCD.....Partnership for Child Development
PCI.....Project Concern International
PHHS.....Post-Harvest Handling and Storage
PMP.....Performance Management Plan
PPP.....Public-Private-Partnership
RBC.....Rwanda Biomedical Centre
RCC.....Regional Consultative Committee
RDHS.....Rwanda Demographic and Health Surveys
RDA.....Recommended Dietary Allowances
RDO.....Rwanda Development Organization
RUWASA.....Rural Water Supply and Sanitation Agency
RWARRI.....Rwanda Rural Rehabilitation Initiative
S-WASH.....School Water, Sanitation and Hygiene
SAVE.....Save the Children
SCDE.....Sub-County Director of Education
SGAC.....School General Assembly Committee
SHF.....Smallholder Farmer
SIDO.....Small Industries Development Organization
SNV.....Netherlands Development Organization
TAFSIP.....Tanzania Agriculture and Food Security Investment Plan
TAMISEMI.....Office of the President Regional Administration and Local Government

Acronyms

TARI.....Tanzania Agriculture Research Institute
ToT.....Training of Trainers
UN.....United Nations
UNDAP.....United Nations Development Assistance Plan
UNESCO.....United Nations Educational, Scientific, and Cultural Organization
UNICEF.....United Nations Children's Fund
USA.....United States of America
USAID.....United States Agency for International Development
USDA.....United States Department of Agriculture
USDA-FAS.....United States Department of Agriculture- Foreign Agricultural Service
VCA.....Value Chain Assessments
WASAC.....Water and Sanitation Corporation
WASH.....Water, Sanitation and Hygiene
WFP.....World Food Programme
WHO.....World Health Organization
WRA.....Women of Reproductive Age
WV.....World Vision

Introduction

The benefits of School Feeding Programs

Many pre-school and school-age children living in low-income, food-insecure countries are at risk of experiencing malnutrition, poor health, and poor sanitation, all of which impact their cognitive, motor, and social-emotional development (Grantham-McGregor, 2007). Worldwide, there are 149 million children under 5 years of age experiencing stunted growth and 45 million experiencing wasting (UNICEF, WHO & WB, 2021). These overlapping conditions arise from multiple factors with poor-quality diet being the most common among them. Investments in child and maternal nutrition are critical to reducing hunger and improving food security in developing countries. International financial institutions emphasize the importance of ending malnutrition as a means to improve economic and human development outcomes as they relate to better health, education, and overall long-term human capital (Shekar et al., 2017). Evidence also suggests a reduction in malnutrition not only improves individual health outcomes but also has the potential to increase economic productivity (Horton & Steckel, 2013) and yield high returns on investments for development activities (Shekar et al., 2017; Alderman et al., 2017; Horton and Hoddinott, 2014). Moreover, improving nutrition can contribute to improvements in other development targets like increasing school attendance and completion, enhancing cognitive development and learning, reducing poverty among children and adults, and increasing a country's overall wealth (Shekar et al., 2017). Therefore, programs that aim to eradicate child and maternal malnutrition, including school feeding programs, are critical to improving health and education outcomes in developing countries and further increasing their human capital potential. School feeding programs in developing countries have become a tool to complement interventions that seek to address problems of malnutrition among school-age children. In many cases, school feeding programs also target the nutrition of mothers and children under age five as a means to ensure children achieve proper brain development before school enrollment. In 2020, 388 million children benefited from school feeding programs worldwide, 53 million of those in Sub-Saharan Africa (WFP, 2021).

Beyond improving child nutrition, school feeding also seeks to improve educational outcomes, including but not limited to enrollment, attendance, and literacy, to further improve national human capital. School feeding programs are also safety net tools critical to addressing, high levels of poverty and food insecurity in places that suffer from these problems. School feeding programs can rely on take-home rations and cash-based transfers to improve the food security of disadvantaged households (Bundy et al., 2009). Another contribution of school feeding programs is the capacity to impact gender equality by creating incentives for families to encourage girls to attend school (e.g., meal provision; water, sanitation and hygiene [WASH] targeting girls). These incentives help minimize cultural barriers to female access to and retention in the educational system. At the community level, the use of the Home-Grown School Feeding (HGSF) framework (FAO & WFP, 2018) promotes the connection between the local agricultural system and school meal provision. According to the HGSF framework, adding smallholder capacity-building activities into comprehensive school feeding programs can expand the gains of school feeding beyond the educational sector and toward the well-being and economic prosperity of the communities. Globally, school feeding programs can contribute to ensuring gains on sustainable development goals (SDG) #2-ending hunger, #4-equitable access to quality education, and #5-gender equality.

The US Government, through the McGovern-Dole Food for Education and Child Nutrition (MGD) program, has allocated resources to carry out comprehensive food for education programs in high poverty, high food-insecure countries. The goal of the program is,

To reduce hunger and improve literacy and primary

education, especially for girls. By providing school meals, teacher training and related support, McGovern-Dole projects help boost school enrollment and academic performance. At the same time, the program also focuses on improving children's health and learning capacity before they enter school by offering nutrition programs for pregnant and nursing women, infants and pre-schoolers. (USDA-FAS, n.d).

Research Approach

Given the relevance of school feeding programs worldwide and the need to improve learning about the MGD program, USDA-FAS has partnered with USAID Africa Bureau to award Mississippi State University (MSU) a cooperative agreement to conduct research and learning activities from the implementation of the MGD projects in Africa, revolving around three sets of questions from the MGD Learning Agenda (USDA, 2016), as follows:

1. Partnerships: What kinds of partnerships with the private sector and/or host country governments are the most effective at ensuring program sustainability? Among successful partnerships, who are the key players, and what are their roles? In what contexts do private sector and/or government partnerships work best, and which contexts may be more challenging?
2. Economic analysis of MGD programs: How do the impacts of local procurement models and other community and nationally sourced models compare with those that rely on international food sources?
3. Nutrition effects on educational outcomes: How do school meal interventions and the nutritional aspects of these meals in pre-schools and primary schools influence educational outcomes in students?

Researchers from MSU used existing performance data provided by USDA from active or recently completed MGD and Local and Regional Food Aid Procurement Program (LRP)1 [1]project activities in six African countries: Burkina Faso, Kenya, Rwanda, Senegal, Sierra Leone, and Tanzania. MSU also established communication with MGD and LRP implementing partners in each country of interest and was able to access and further analyze more detailed monitoring and evaluation datasets. In addition, MSU incorporated primary data collection procedures by conducting semi-structured interviews that helped inform the analysis of the research questions but were specifically used to address research question #1 on partnerships.

Table i.1. Summary of case selection per research question

Research Questions	Countries of Interest					
	Kenya	Rwanda	Senegal	Burkina Faso	Sierra Leone	Tanzania
Q1. Partnerships	Implementer: World Food Programme	Implementer: World Food Programme			Implementer: Catholic Relief Services	Implementer: Project Concern International now known as Global Communities
Q2. Procurement Analysis	Implementer: World Food Programme	Implementer: World Food Programme		Implementer: Catholic Relief Services		
Q3. Nutrition-Educational Outcomes			Implementer: Counterpart International			Implementer: PCI/GC Implementer: Project Concern International now known as Global Communities

In agreement with USDA and USAID, a sub-set of countries was selected to address each research question. Research question #1 used MGD and LRP implementation information from Kenya, Rwanda,

1 LRP projects are complementary to MGD implementation and seek to implement field-based projects that provide development assistance and emergency relief using locally procured commodities. Starting in FY 2020, LRP components were included in the MGD awards to allow for up to 10% of MGD funds to be allocated to LRP activities.

Sierra Leone[2] , and Tanzania. Research question #2 prioritized LRP implementation in Burkina Faso, Kenya, and Rwanda. MGD implementations in Senegal and Tanzania were selected to address research question #3. The table below summarizes the set of research questions and cases, as well as the name of the organization (i.e., Private Voluntary Organization (PVO); or the World Food Programme -WFP) leading MGD and LRP implementation in each country.

The evolution and contributions of the MGD program to school feeding worldwide

Acknowledging the nutrition and education needs of people living in low-income and food-deficit countries and the potential impacts of investments to end malnutrition, the MGD fund has committed to promoting school feeding and child nutrition programs. The program helps support education, child development, food security, and nutrition by providing agricultural commodities from the US, locally and regionally procured commodities (nowadays known as the LRP component), and financial and technical assistance to support school feeding and maternal and child nutrition programs. The MGD program dates to the early 2000s, with the launch of the Global Food for Education Initiative (GFEI), announced by President Clinton at the 2000 G-8 Summit in Japan. The pilot program received strong support, most notably from Senator Bob Dole and George McGovern—a former senator and ambassador to the UN. GFEI was a pilot program meant to enhance nutrition and promote school enrollment among school-aged children in low-income and food-insecure countries. The US government committed $300 million in resources to this pilot program, which was expected to reach about 9 million children with school meals or take-home rations in 38 countries across Africa, Asia, Latin America, and Eastern Europe (The White House, 2000). The program was run by the USDA with the support of PVOs and the WFP. The main objective of this pilot was to provide in-kind commodities and transportation funding for school meal provision.

Lessons from the GFEI pilot were later incorporated into the design of the McGovern-Dole Food for Education and Child Nutrition program, named after Senators McGovern and Dole, in recognition of their support for school nutrition in food-insecure, low-income countries. The MGD program was first authorized in the 2002 farm bill and reauthorized in subsequent farm bills to provide commodities, financial, and technical assistance for foreign preschool and school feeding programs (Nair, 2022). The bill assigned USDA the role of program lead, and today MGD falls under the USDA-FAS strategic objective 4.1. "Implement non trade-focused congressionally mandated programs." The MGD efforts are relevant not only to alleviate short-term hunger, improve educational outcomes, and increase the use of health and dietary practices among groups benefiting from the program but also because the program's presence in a country contributes to developing long-term capacity for school feeding programming, which ultimately feeds into human capital development. As this study will show in section 1, through program partnerships, implementing partners have become critical players in the design of school feeding policies and regulatory frameworks. These types of efforts are significant because they contribute to the sustainability of school feeding:

"McGovern-Dole projects are built on the premise that USDA assistance is limited and that, to sustain progress, McGovern-Dole seeks to maintain the benefits to education, enrollment and attendance of children in schools in targeted communities, and bring other long-term benefits to targeted populations of the recipient country." (USDA, 2020, p. 5)

Currently, the MGD programmatic structure is defined by its two strategic objectives that, in turn, are the program results frameworks: (1) to improve literacy of school age children with focus on early grade reading; and (2) to increase the use of health and dietary practices (see appendix 1: MGD results framework 1 and 2). In the early 2010s, the USDA shifted toward a Results-Oriented Management approach which, in the case of MGD, led to the development of the two results frameworks/strategic objectives and 3-year awards. From this time forward, USDA-FAS requested that implementing partners provide semi-annual performance reports (using the results framework) and shifted from measuring outputs only to also measuring

2 At the time of analysis, Sierra Leone had not been awarded an LRP project component. But the most recent award, 2021-2025, included an LRP component.

outcomes through baseline, midterm, and endline evaluation efforts. The two MGD results frameworks serve as an adaptable blueprint for implementers to develop program activities in each targeted geographic area within each target country. Derived from the results frameworks, the program has a series of measurements to track program outputs and outcomes (MGD indicators). Implementing partners adapt their programmatic activities to fit local needs, and track progress using the MGD standard indicators and custom measurements (when added by the implementer and approved by USDA-FAS). Implementers report program progress biannually using MGD and custom indicators as established in their Performance Management Plan (PMP). Additionally, the program must incorporate baseline, midterm, and endline evaluations to assess the state of program progress and ultimately capture changes produced by the implementation. Researchers from MSU used monitoring (MGD indicators) and evaluation data to address the three key research questions of this study. Between fiscal years (FY) 2004 and 2021, appropriations for MGD account for over $2.9 billion from Farm Bill funds and benefit 39 countries (Review of annual report to Congress – see Table 2.1 from section 2 for more details).

The landscape of School Feeding Programs worldwide

The USDA-FAS MGD is one of a series of school feeding programs in developing countries that receive donor support. Apart from the USDA, intergovernmental organizations like the WFP and PVOs also play a key role in the design and implementation of school feeding programs worldwide. The Global Child Nutrition Foundation (GCNF) continues its efforts to assess the state of school feeding by releasing a periodic report (i.e., Global Survey of School Meal Programs). In Africa, the African Union – New Partnership for Africa's Development (AU-NEPAD) has become a champion of school feeding in the region. In 2016, the Heads of State and Governments of AU member countries signed the Agenda 2063, CESA 16-25, which adopted the HGSF decision. In 2017, the 31st Ordinary Session of the African Union Executive Council adopted the Sustainable School Food and Nutrition Initiative (SSFNI) as a means to address the goals of the Africa Regional Nutrition Strategy (2015-2025) (African Union, 2021). The AU-NEPAD has worked closely with partners like the WFP to design and promote the adoption of school feeding policies and regulatory frameworks among their associated countries.

In 2011, the WFP Center for Excellence against hunger located in Brazil (WFP Brazil CoE) emerged as a center providing school-feeding policy innovation and technical assistance to developing countries. First drawing on lessons from the Brazilian experience, the WFP Brazil CoE has become a key player in the design and implementation of government-led efforts on school feeding. The key element of the WFP Brazil CoE's approach is the linking of "school feeding initiatives to local agricultural systems." The Center accomplished this by incorporating the HGSF framework (FAO & WFP, 2018) into its policy and technical assistance efforts. Utilizing the HGSF framework, the WFP Brazil CoE helped obtain government commitments and aided in the design and implementation of school feeding programs across several countries. Overall, the WFP has become a significant player in school feeding worldwide. Lessons from the WFP work have been incorporated into MGD implementations as this organization is one of the implementers of MGD program projects. The interminglingoftheWFPschoolfeedingdesignframework and the presence of MGD and LRP funds continue to improve local capacity for school feeding sustainability.

The sustainability of school feeding activities is integral to ensuring that donor-led efforts do not end when programmatic efforts end. Bundy et al., (2009) developed a framework that suggests that there are five pre-conditions must be met in order for school programs to achieve sustainability. These are: [1] clear national and sectoral policy frameworks; [2] stable funding and budgeting; [3] institutional capacity to implement and coordinate programs; [4] ensure that the design and implementation is needs-based, cost-effective, well-adapted, and contributes to the delivery of quality school feeding programs; and [5] strong community participation. Through the analyses presented in this work, we show that the implementation of MGD program projects in Burkina Faso, Kenya, Rwanda, Senegal, Sierra Leone, and Tanzania, have provided useful evidence that continues to inform sustainability frameworks that feed into school feeding programming.

The structure of this report

This report used data from the implementation of MGD projects in six African countries and is

divided into three sections that address three research components: [1] partnerships for school feeding; [2] analysis of local procurement models; and [3] nutritional components and effects on educational outcomes.

For research component 1, partnerships for school feeding, this report provides the case study results for the analyses of MGD and LRP related partnerships in four countries: Kenya (Case Study #1), Rwanda (Case Study #2), Sierra Leone (Case Study #3), and Tanzania (Case study #4). Each case study includes three sub-sections that provide an analysis of school meals partnerships, as leveraged by MGD implementation in each country. Each case study includes the following sections: [1] Institutional framework for school feeding which provides details about the socio-economic context in each country of interest, as well as the policy framework for school feeding; [2] a summary of the MGD implementation, targeting the key program outcomes to further connect outcomes with partnerships; and [3] the analysis of partnerships for school feeding as the effect of MGD presence in each country, using four partnership types: public, private, non-profit, and community-level.

For research component 2, the report presents results from the analysis of the Local and Regional Procurement model under the MGD framework. The first part of this section presents program background information, including different LRP activities and mechanisms. The second part of this component includes a case study analysis of the three countries of interest for this research question: Burkina Faso, Kenya, and Rwanda. This is followed by a report of LRP performance indicators and comments about the LRP monitoring system. This section closes with a discussion of performance data and some recommendations for future research.

To address the research question under component 3, the MSU team first conducted three in-depth desk reviews of current literature (sub-section 1). These desk reviews examined nutrients associated with cognitive development[3], nutrients associated with stunting,[4] and the relative impact of school meal programs on educational outcomes for preschool-age children.[5] Sub-section 2 of research component 3 then evaluates what specific foods and nutrients are provided as part of the school meals, frequency of meals, and adequacy of nutrient content using data provided by the MGD implementing partners in Senegal and Tanzania. Sub-section 3 is an evaluation of the impact of school meal programs in Senegal and Tanzania as it relates to providing adequate nutrition for cognitive development, normal growth and development, and improving educational outcomes. To do this, results from component 3 sub-section 1 and component 3 sub-section 2 of this study were compared.

3 Roberts, M.; Tolar-Peterson, T.; Reynolds, A.; Wall, C.; Reeder, N.; Rico Mendez, G. The Effects of Nutritional Interventions on the Cognitive Development of Preschool-Age Children: A Systematic Review. Nutrients 2022, 14, 532. https://doi.org/10.3390/nu14030532

4 Manuscript is under review in a peer-reviewed journal.

5 Wall, C., Tolar-Peterson, T., Reeder, N., Roberts, M., Reynolds, A., Rico Mendez, G. The Impact of School Meal Programs on Educational Outcomes in African Schoolchildren: A Systematic Review. International Journal of Environ-

Research Component 1: Partnerships for School Feeding

Kenya, Rwanda, Sierra Leone, & Tanzania

Introduction

Under MGD programming efforts, partnerships with a variety of actors are critical to building organizational, technical, and financial capacity to further ensure sustainable short-term and long-term school feeding outcomes. MGD project components offer opportunities for implementers to partner with local and non-local stakeholders to leverage existing school feeding program opportunities. The underlying assumption of each MGD implementation is that its school feeding activities will be handed off for leadership and management to local stakeholders, which is usually the national government with the support of local and regional authorities. In order to reach this point, and ensure sustainable school feeding programming, partnerships are critical. This section will present examples of MGD's best practices in school feeding partnerships. Further, the following sections show that sustainability and handing off school feeding to local actors is mainly possible because of implementer commitment not only to the delivery of quality project implementation, but also because of its engagement in policymaking, contributions to developing regulatory frameworks, capacity to identify and secure of public and private funding opportunities, and the inclusion of programmatic efforts to ensure capacity building of public sector and civic society organizations. Therefore, partnerships with a variety of actors are important for the sustainability of school feeding efforts because they strengthen national, regional, and local capacity to carry out programming once development partners relinquish program ownership. Partnerships in this study are defined as any relationship—whether permanent or temporary—between groups, organizations, or persons where there is collaboration, that in cases includes the transfer of resources (e.g., technical, financial, organizational, human capital), in an effort to achieve shared or similar school feeding-related goals to gain mutually beneficial outcomes. In some cases, the collaboration can take a contractual form (i.e., subgrantees of MGD implementers), in which case, MGD implementing partners work directly with technical or expert organizations to implement project components. This study considers these as partnerships because of the capacity of the relationship and the nature of activities performed impact systemic change and long-term sustainability. Partnerships for school feeding should support planning and implementation, contribute to developing sustainability strategies and tactics, and/or build capacity among the different actors engaged in processes.

The MGD learning agenda (USDA, 2016) emphasizes a need to conduct research on partnerships around school meal program implementation to identify what type of partnerships and institutions are better suited to ensure program sustainability. Framed by the gaps identified in

the MGD learning agenda, the research conducted by the MSU team seeks to address the following research question:

What kinds of partnerships with the private sector and/or host country governments are the most effective at ensuring program sustainability? Among successful partnerships, who are the key players and what are their roles? In what contexts do private sector and/or government partnerships work best, and which contexts may be more challenging?

To address this research gap, the MSU team collaborated with USDA and USAID to select four countries of interest where MGD implementations exhibited potential learning opportunities around partnerships. The countries prioritized for the analysis are Kenya, Rwanda, Sierra Leone, and Tanzania. The research team developed analysis tools and examined the local contexts using secondary data sources, conducted national-level policy analyses, carried out a remote qualitative data collection, and conducted qualitative data analysis and a systematic desk review of MGD program performance data provided by USDA and implementing partners. Table 1.1 summarizes semi-structured interviews conducted for the overall research project.

Using the sources indicated above, researchers conducted a case-by-case (one per each MGD implementation in the four selected countries) process tracing and outcome mapping project implementations and contexts to determine which processes, actors, and relationships led to specific program outcomes. This simultaneously allowed the team to further outline how certain partnerships contribute to program successes, how implementers managed implementation challenges under a collaborative model, and what knowledge emerged from each implementation site. Each of the four cases includes three broad sections:

[1] The **institutional framework** includes contextual information about the socio-economic conditions of each country with particular emphasis on nutrition, food security, agriculture, and education, as those lay at the core of MGD programming implementation. The institutional framework also includes a policy analysis emphasizing how national policies have approached school feeding. Additionally, this section provides details on recent school feeding policies and regulatory developments (i.e., in the four cases, each country has at least a written National School Feeding Policy). The policy timeline varies according to each country's contextual circumstances.

[2] The **MGD program description** section depicts the role each implementing partner plays and their respective local contexts, including its role in school feeding policy formation; it also provides a summary of spatiotemporal programmatic changes; and it highlights high-level program outcomes per component (i.e., meal distribution, education and literacy, nutrition and health, and local procurement, where applicable). The purpose of this section is not only to inform the reader about the major MGD programmatic results but

Table 1.1 Summary of Interviews Conducted Under the MSU-led Research Project

Country	MGD implementing partner	Number of interviews	Number of persons interviewed
Kenya	WFP	9	9
Rwanda	WFP	8	12
Burkina Faso	CRS	17	17
Sierra Leone	CRS	8	8
Tanzania	PCI- Global Communities	11	11
USG and experts	---	9	9
	Total	62	66

also to connect these with the variety of partners that participated in implementation and engaged in school feeding programming development in each country.

[3] The **partnerships for school feeding** section builds on findings from primary (interviews with staff from the implementing partners) and secondary data (program performance data and reports) analysis. Results are categorized into partnerships types as follows: (i) public; (ii) private; (iii) non-profit; and (iv) community-level. These categories are not mutually exclusive but served as analytic groupings to create a better understanding of the types of relationships that implementing partnerships entered into and developed during MGD implementation. This analysis shows the role that implementing partners play, thought the establishment of partnerships, in the development of alternatives for the sustainability of school feeding once the program is ready to be transferred to local actors for management and implementation. Table 1.2 summarizes the partnership categories used in this study; it includes the types of actors involved, specific participating actors, and the partnership priorities. This table will serve as a guide to reading the partnership sub-section within each case study.

Table 1.2 Partnership Typology (Initiated by the Implementing Partner/PVO)

Type of Actors Involved	Actors	Priorities
PUBLIC Governmental institutions at different levels of governance: • National / Central • Domestic / Regional • Local • International (Regional or Global)	**Policy Making and Implementation Bodies:** Central level of government (Executive) • Ministry of Education • Ministry of Health • Ministry of Agriculture • Treasury • Etc. **Legislative Bodies:** (Legislative) Local and Regional Administration: • Secretary of Education • Extension Services • Secretary of Health • Etc.	• Ensure governmental commitment towards school feeding. Budget allocation. • Policy making that contributes to capacity building: technical capacity at the school level. • Develop national guidelines for school feeding. • Cross-sector collaboration • Accountability: Monitoring and Evaluation Systems
PRIVATE • Large enterprises • Medium enterprises • Small enterprises	**Value Chain Actors:** • Farmer / Producers • Food Industry • Fortification • Transportation	• Income generation activities • Ensure access to markets
PUBLIC - PRIVATE (*) • Research and Development Institutions	• Research Institutions • Universities • International Donors leading R&D activities	Research findings that contribute to: • Improved productivity • Enhance a socially pressing problem (e.g. nutrition)
NGOs • Inter-governmental organizations • International NGOs • Domestic NGOs	**MGD Implementation** • USDA-FAS and Implementing partner • Implementing partner and Subgrantees • Local NGOs collaborating in the implementation of MGD and LRP activities	• Ensure availability of funding for school feeding related activities. • Develop capacity to ensure sustainability: transition / Graduation / Handover. • Identify key actors responsible for implementation of school feeding activities post award.
LOCAL COMMUNITIES • Individuals • Civil society organizations	• PTAs / School Management Committees • Farmer Organizations • SILC Groups / Women lending groups • Other local organizations promoting school feeding like activities	• Accountability • Develop local capacities for school feeding • Communitiy contributions (when feasible) • Ensure a fair distribution of school-related activities within the community / Avoid overburden of certain groups (e.g. women) • Increase awareness about nutrition, health, and importance of education (local champions)

(*) Depending on the lead partner, these types of partnerships were included under public or private categories.

Analysis of School Feeding Partnerships in Kenya

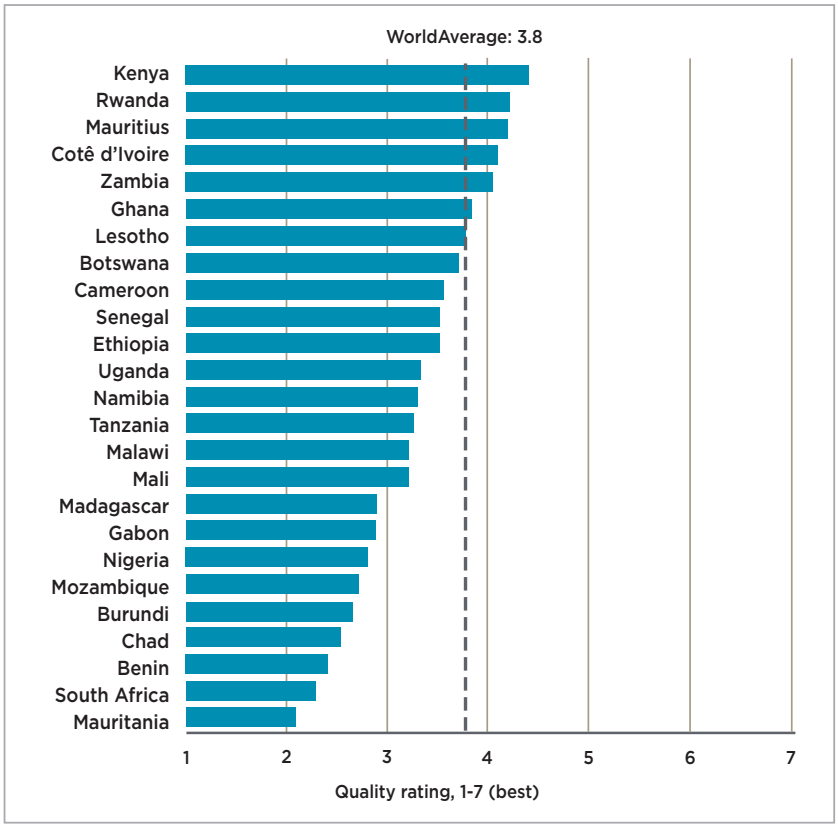
Institutional Framework for School Feeding

Socio-economic and Policy Context

Over the most recent decade, Kenya has made economic progress that has led to sustained economic growth, social development, and political stability gains (World Bank, 2021). Kenya experienced an approximate 5% GDP in 2021 and expects to see a decline in the poverty rate after pandemic conditions stabilize. World Bank data indicate the proportion of Kenyans below the national poverty line (US$1.90 per day in 2011 PPP) has declined from 46.8% in 2005/06 to 36.1% in 2015/16 (World Bank, 2018). Kenya's poverty rate remains the lowest when compared to its East African neighbors. Further, Kenya's labor force participation is comparably higher (71.89%) than its sub-region neighbors (64.47%).

Regarding Kenya's educational outcomes, in 2015, approximately 84% of the population ages 14 years and older could read and write, a high rate compared to countries like Ghana at 71%; however, only 58% of adults ages 24 and above have completed primary school (World Bank, 2018). Kenya's educational system is considered the strongest in Africa, reflecting the policy and material investments that have been made over the past decades. Kenya's favorable policy environment has produced key educational outcomes which include a 99.0% enrollment at the primary school level before COVID-19 (UNICEF, n.d.-c). The World Economic Forum ranked Kenya's educational system as the strongest in Africa (Figure 1.1), and Kenya's Human Capital—the knowledge, skills, and health that people accumulate over their lives— has been described by the World Bank as the best in Africa (Andrews et al., 2021). When compared with other African nations, the current status of the Kenyan educational system suggests a correlation between educational outcomes and its contributive policy environment.

Figure 1.1 World Economic Forum executive opinion survey results "Quality of Africa's education system"



Source: World Economic Forum Executive Opinion Survey

Kenya's inclusive, multisector approach to policy formation has resulted in a policy environment favorable to socio-economic advancement. Kenya's school meal program has not only shaped the formation of critical national policies but also has served as a platform for implementing these policies to improve health nutrition and protect vulnerable households. It's worth noting that the nonprofit sector has been a significant player in Kenya's policy evolution and remains a critical partner in the future of Kenya's school meal program. The current role and position of nonprofits, such as the WFP, make them an important channel for navigating policy issues in development, as this report will inform later in the educational environment section.

Health and Nutrition Context

United Nations Children's Fund (UNICEF) estimates the national prevalence of stunting for children under age five as 26% and as much as 46% in Kitui and West Pokot counties. Similarly, 11.0% of children are underweight and 4.0% are experiencing wasting (UNICEF, n.d.-a). Under-five infant mortality is estimated at 42 per every 1,000 live births. Similarly, the maternal mortality ratio is 342 per 100,000 live births. Regarding nutrition, consumption of iodized salt is at 95.0% among the population. Only 62% of Kenyans have access to improved drinking water, and even fewer (29%) have access to improved sanitation (USAID, 2022).

In 1994, the National Plan of Action for Nutrition was introduced to improve household food security and promote good dietary habits and infant feeding practices. Some of the most recent health policies adopted by the Kenyan government emphasize nutrition's connection to educational outcomes. For example, the National School Health Policy and National School Health guidelines (2009) emphasize achieving health outcomes using the school environment and the fledgling Kenyan School Meals Program as the entry point. The National School Health policy uniquely stressed the role of the community in resource mobilization, planning, and implementation of the Kenyan School Meals Programs. Similarly, the National Social Protection Policy was passed in 2011 and aims to leverage school meals as a safety net for vulnerable households, further underscoring the role of school meals as a social protection measure in the arid and semi-arid parts of Kenya. In 2016, three key ministries, the Ministry of Education, Science and Technology, the Ministry of Health, and the Ministry of Agriculture, Livestock, and Fisheries, jointly developed the School Nutrition and Meals Strategy for Kenya. The policy's objectives again reflect the multisector collaboration approach and include increasing intake and awareness of adequate, culturally appropriate, nutritious meals amongst school-age children while improving enrollment, attendance, retention, completion, and learning of school-age children. The policy also aimed to promote local economic, social, and agricultural development and partnership among relevant institutions.

Agriculture and Food Security Situation

Agriculture contributes an estimated 33% of Kenya's gross domestic product. Approximately 40.0% of Kenyans are employed in the Agricultural sector; of those, 70.0% are rural dwellers (USAID, 2022). Kenya's arid and semi-arid counties, while home to a population of 10 million people, are prone to recurrent drought, human conflict, a legacy of marginalization by the government, and a lack of international investments (Ibid). The global hunger index in Kenya for 2021 was 23.0%, which is considered "serious" according to the index measurements. Similarly, the global food security for 2020 was 49.0%, raking Kenya in the 90th position worldwide (USAID, 2021).

Kenya's vulnerability to drought and locust invasion poses some of the toughest challenges to agricultural productivity in the country. The Agriculture Sector Development Strategy (2010–2020) was introduced to ensure food and nutrition security for all Kenyans and generate higher incomes and create employment opportunities. In 2011, the agricultural ministry introduced the National Food and Nutrition Security Policy to further address the threat of food and nutrition insecurity in Kenya (National Food and Nutrition Policy, 2011). This policy similarly targets the school environment and School Meals Programs as platforms for promoting nutrition awareness. Specifically, the National Food and Nutrition Security Policy established standards and regulations for storage, preparation, handling, and quantity of food served to students under School Meals Programs. The policy also prioritized the dissemination of information about good nutrition and dietary practices in schools. Two years after introducing the National Food and Nutrition Security Policy, the Ministry of Agriculture introduced the Agriculture, Livestock and Fisheries' Strategic Plan (2013–2017) which fell in line

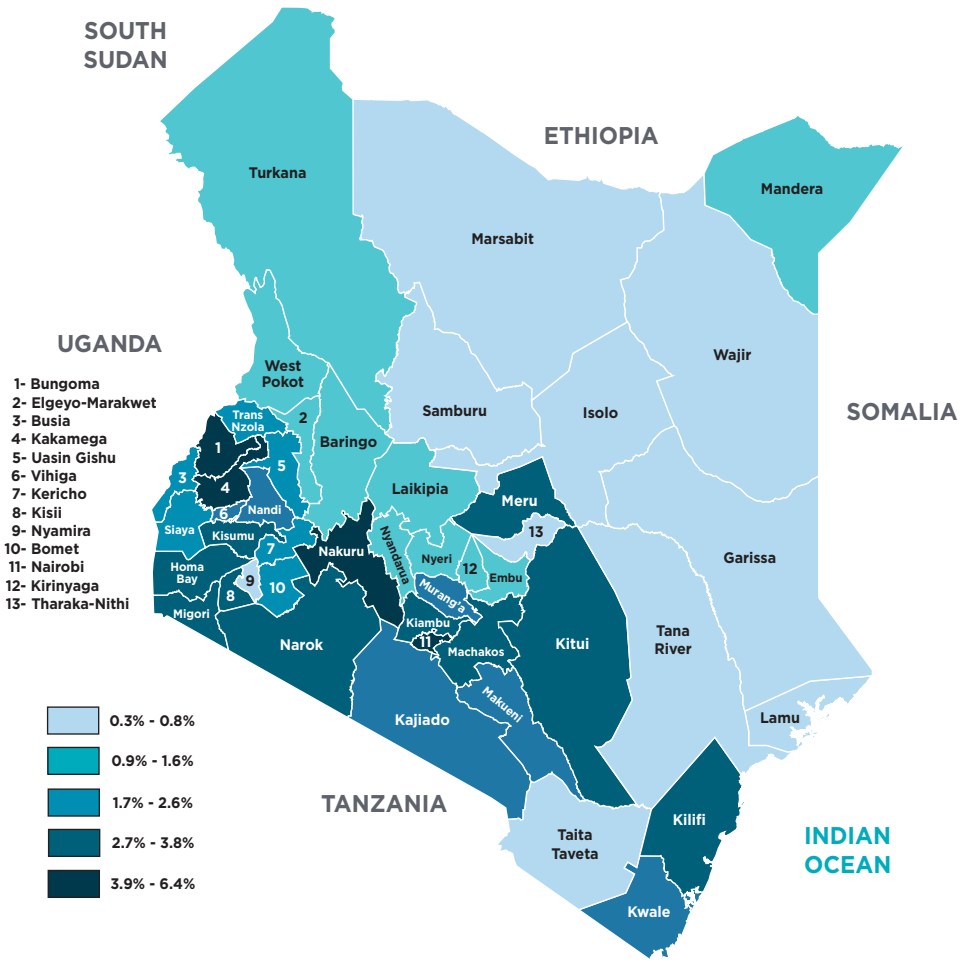
with their prior objective to address food and nutrition insecurity. The strategic plan focused on establishing irrigation projects, fishponds, and water-harvesting infrastructure in schools. The Kenyan government has consistently approached policy formulation—over the past three decades—in a way that emphasizes use of inter-agency and sectoral collaboration in formulating policy; the school environment and the school meals programs have inspired and served as a platform for advancing almost all of the aforementioned policies.

School feeding and Educational Policy Environment

The policy framework in Kenya has constantly adapted to create and support an environment favorable to social and economic development. In 1968, the Government of Kenya established the Education Act, which mandated that the Ministry of Education, Science and Technology be the institution responsible for education and set the foundation for Kenyan policy evolution (Eshiwani, 1990). National policies seeking to increase access to health and universal basic education for Kenyan school children have featured prominently in the past few decades, especially at the government level. International donor community activities have significantly impacted the Kenyan policy environment. In 2002, the Kenyan government introduced the Free and Compulsory Primary Education policy (Kenya-Ministry of Education, 2021; Holland, 2021), which was implemented in the 2003 academic period in response to millennium development goals 3 and 4. The introduction of the Free and Compulsory Primary Education policy resulted in nearly a million more students enrolling in primary school and increased the demand for school feeding in Kenya. In 2005, the government introduced the Kenya Education Sector Support Program (KESSP), which provided a comprehensive guide for education and made school feeding an integral part of the Kenyan educational system.

In 2009, the Kenyan government adopted the National School Health Guideline, with a core objective of providing a balanced school meal for children in all Kenyan schools. By 2010, Kenya had declared education a fundamental human right and required basic education to be 'free and compulsory.' The Kenyan constitution declared food access a basic right. The WFP's MGD mid-term project evaluation described Kenya's "policy environment as a relatively well-developed, with policies that seek to promote advancement in education, health, and nutrition, as part of a comprehensive development plan (KY.MGD.Midterm.2016-2020). The WFP-led MGD project implementation, has had a significant impact in enhancing the education and school feeding policy and governance environment. For example, WFP participated in the design of Kenya's first National School Meals and Nutrition Strategy which was approved and launched May 2018. These new policies have also increased the Kenyan government's budgetary allocation for education, contributed to the establishment of a nationally owned

Figure 1.2. Distribution of population attending primary schools (county level) - 2019



Source: Authors using data from Bondarenko, et al., 2022

school feeding program, and a framework that supports a multisectoral approach to achieving Kenyan educational goals. Figure 1.2 shows the geographic distribution of population attending primary school in Kenya. The presence of nonprofit organizations, such as the WFP, UNICEF, and other UN agencies in the school feeding related activities, has strongly influenced Kenya's policy evolution. The WFP's HGSF framework aligns with recommendations for more sustainable school meal programs based on availability of national resources (KY.MGD. Baseline.2016-2020; Bundy et al., 2009). The creation of key policies and relevant supporting documents, such as the School Meals and Nutrition Strategy 2017-2022, and the National School Health Policy, have had nonprofit organizations such as the WFP playing a pivotal role in their development.

McGovern-Dole Food for Education Program implementation in Kenya

WFP School Feeding Efforts in Kenya

The WFP has been in Kenya since the 1980s and has pioneered Kenya's School Meals Programs in collaboration with government institutions, targeting children in arid and semi-arid areas of the country. Through donor support, the WFP has continued to provide hot school meals and take-home rations to school children (Holland, 2021). The current WFP Kenya country strategic plan (2018-2023) prioritizes four strategic outcomes including: a) increasing access to food by refugees and populations affected by natural disasters; b) increasing access to an inclusive food system for smallholder farmers and food-insecure households; c) strengthening the capacity of national and county institutions to respond to food security needs; and d) facilitating government, humanitarian, and development partners access to effective and cost-efficient logistics services. The 2018-2023 WFP Kenya country strategic plan has a budgetary allocation of US $169.4m for 2021 (WFP, 2021).

Since 2004, the WFP has received funding from the USDA-FAS for the implementation of the MGD program in Kenya, and since 2017 for the implementation of the LRP project. Two phases of the MGD program were successfully implemented between 2004 and 2016 (which consist of six MGD awards), while the LRP project component was implemented between 2017 and 2020. The third and final phase of the MGD project (the seventh MGD award) is underway and scheduled to end in 2023 because the WFP is set to fully hand over the school feeding program to the Government of Kenya.

Under the MGD school meal program, the WFP is dedicated to supporting the transition toward a government-owned and administered program; the WFP continues to provide technical training and support to Kenyan ministries and departments for procurement and monitoring, food distribution, food safety and storage, and management of the school feeding program at all levels. The school meal system, implemented by the WFP-Kenya, has been the most extensive and impactful intervention by the WFP in Kenya, due to its outcomes in terms of number of beneficiaries, duration, and effects on the national policy framework for school feeding, therefore, it provides valuable lessons for other African countries implementing school feeding programs.

MGD Program Highlights

Kenya is on the verge of completing a historic transition from a donor-led to a government-managed national school meal program. Under the leadership of the WFP and with financial support from USDA-FAS through the MGD program, Kenya has gone through the development of a school feeding program cycle and now has installed the framework for the implementation of an HGSF program, named Home-Grown School Meals Program by Government of Kenya). Kenya's progress in transitioning from a donor-driven school meal program to a fully government-owned and administered national school feeding program creates a unique learning opportunity for the network

of nations targeting school feeding activities in Africa. In line with the WFP's vision to reduce hunger and improve literacy and primary education, especially for girls, USDA-FAS extended MGD funding for school feeding to be implemented by the WFP-Kenya. USDA-FAS's support for the school meal program in Kenya spans three phases beginning in 2004, with seven different MGD awards and one LRP project. Phase 1 started in 2004 and ended in 2006, it includes three one-year awards; Phase 2 covers the 2007-2016 period, and implementation took place through three different awards (2007-2009; 2011-2013; and 2014-2016); the third and final phase of MGD in Kenya started in 2016 and is expected to be completed in 2022, it includes one MGD award (2016-2022) and one LRP award (2017-2020).

The first phase of the MGD program between 2004 and 2006 provided in-kind food commodities, helping reach an estimated 1.2 million schoolchildren annually, of which 48 percent were girls (Holland, 2021). The MGD intervention was unique in that it provided "dedicated funding to support complementary school-level interventions for health, nutrition, sanitation, and hygiene, as well as teacher training and child literacy. MGD also included robust funding to afford government capacity-building toward the intended, fully government-administered program" (Holland, 2021). The immediate impact of Phase 1 provided a rationale for the USDA-FAS to provide additional funds for Phase 2, which was implemented from 2007 through 2016. By the end of 2016, MGD's support enabled school feeding to occur in 1,766 schools across ten targeted arid counties and unplanned settlements in Nairobi. Project Phase 2 benefited a little over 1.8 million school children directly (KY.MGD.Endline.2014-2016; KY.LRP.Endline.2017-2020).

Phase 2 significantly differed from Phase 1 because it marked the transition toward a Government of Kenya-administered school meals program. In 2010, the Home-Grown School Meals Program was introduced by the government with the support of the WFP in the Kenya school feeding program. This bold action by the Kenyan government signified a clear intention to shift away from a donor-led school meal program to a decentralized and integrated program that leverages the national agricultural and commodity markets (KY.MGD.Endline.2014-2016; KY.LRP.Endline.2017-2020). Phase 3 of MGD was also markedly different because this phase combined both the LRP project activities (2017-2020) and the MGD program model (2016-2022). This is the final stage of transfer from the MGD-funded WFP implemented school feeding program to the government of Kenya-managed Home-Grown School Meals Program. Project Phase 3 prioritized providing technical and capacity-building support to government agencies and institutions, especially in terms of procurement, food distribution, food storage, and activity monitoring in preparation for a complete government-administered school meal system.

Despite the welcome introduction of the LRP project, evaluation results suggest that the local economy, especially smallholder farmers, was highly vulnerable to erratic climatic conditions and financial delays by the government (KY.LRP.Endline.2017-2020). For example, the LRP final evaluation (2017) suggests that even though the LRP activities aligned with the strategies of the HGSF approach, the outbreak of drought in the 2017/18 growing season compelled the education ministry to delay the transition of schools from in-kind to cash-transfer until food prices and markets stabilized. Similarly, Phase 2's final evaluation "found that school meals were provided only 65-70% of school days throughout the program in part due to funding constraints from other (non-USDA) donors, pipeline delays, and occasional insufficient firewood and water provision by the communities" (KY.MGD.Endline.2014-2016). Lessons learned from the LRP project and the Home-Grown School Meals Program provide a helpful glimpse into the potential future challenges of the school feeding programs to be administered by the government of Kenya. A more detailed analysis of this issue is available in section 2 of this report.

MGD Programmatic Components and Outcomes

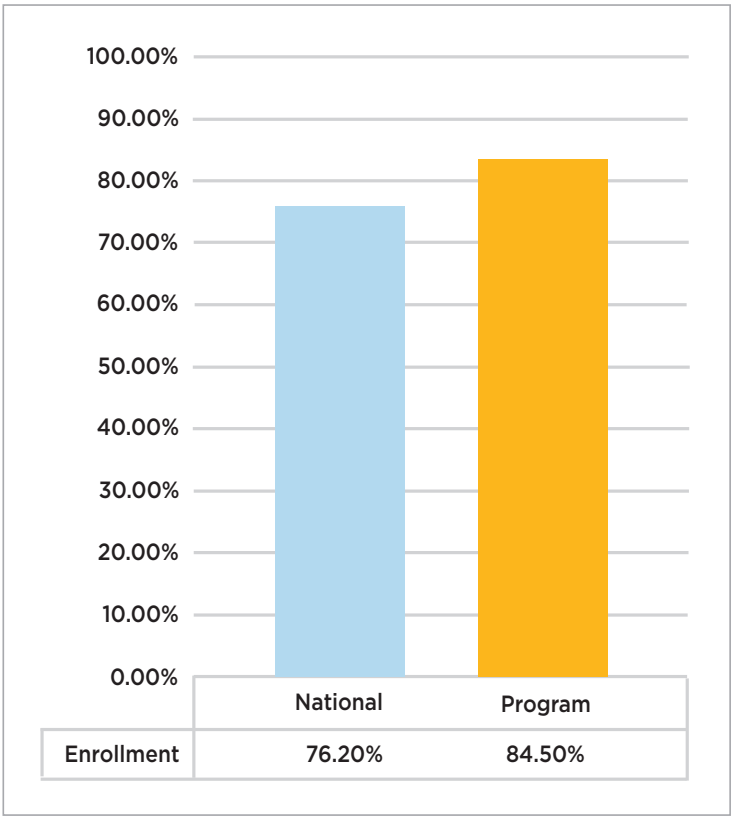
The MGD program and LRP project have multiple interlinked and interdependent outcomes, including school meal provision, education, child nutrition, health, sanitation and hygiene, and strengthening the local and regional supply chain. The impact of this programmatic activity across these multiple sectors is well-documented.

Education and Literacy

The most visible and often cited impact of the MGD program in Kenya is the improved educational enrollment and retention, especially for girls and boys in Kenya's arid and semi-arid areas. The WFP-Kenya's MGD program Phase 2 evaluation results (2017) estimate the

attendance rate as above 84.5% for the targeted schools. These results compare favorably to the national average of 76.2% for 2016 (KY.MGD.Endline.2014-2016) (Figure 1.3). Gender disaggregated data also indicate girls' and boys' enrollment significantly improved from Phase 2's midterm to its end line, with boys recording 3.8% and girls 6.1% at the close of that project period.

Figure 1.3 Kenya — Primary School Enrollment. National Average Compared to MGD Participant Schools (2017)



Source: Authors using WFP information from the Final Evaluation of the MGD-Phase 2 (2014-2016)

According to an interviewee in our study, the impact of MGD on education is significant:

Those are the major achievements of the program because, in terms of enrollment, it has increased enrollment in almost all the counties and even in terms of completion rates. And it has also helped the government to distribute educational services. It equitably extended education to some areas with very low demand for education. So that is something the government was able to achieve in those regions as a result of the McGovern-Dole program. (SEI with key informant, December 2021)

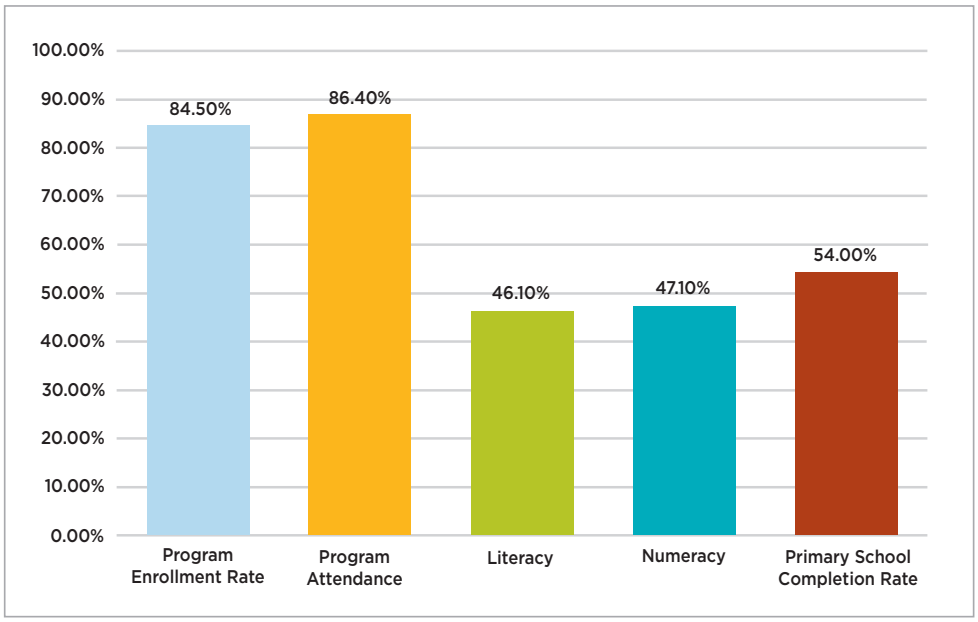
Another participant noted:

One of the big successes is retention and completion. Once you wait over a period of time, there is a big chance, a big likelihood that the child will complete their primary school education. School meals improve their nutritional status. When children have the ability to concentrate on their learning, their learning outcome is also improved; I am not thinking about whether I am going to have lunch or not. In school, there is going to be food today whether the teacher is going to teach or not. Learning outcomes is one great success of the school's meals program. (SEI with key informant, December 2021)

Despite the remarkable progress made in school enrollment and attendance, evaluation results suggest school attendance was inconsistent and often revolved around the availability of school meals. The increase in attendance did not translate into desired educational outcomes, as evaluation findings suggest reading comprehension/literacy among learners did not improve from baseline, especially in the arid areas in Phase 2 of the program. Additionally, national measures of learning outcomes, such as literacy (46.1%) and numeracy (47.1%) rates showed very small improvement, despite the introduction of school meals (both in MGD and non-MGD areas) (Figure 1.4-bars #3 and #4). The primary completion rate remains similarly low at 54.0% (KY.MGD.Endline.2014-2016; Uwezo, 2016). Results of the final evaluation of MGD Phase 2, enlightened the government about the need to include additional programmatic efforts in the education sector if the improvement of educational outcomes was expected. School meal programs are one of the multiple pieces needed to improve learning outcomes.

The lowest literacy rates were seen in MGD targeted arid and semi-arid counties, with 24.5% in Marsabit and 9.9% in Wajir, both of which are far below the national average of 30.0% (KY.MGD.Endline.2014-2016). In Home-Grown School Meals Program schools (government schools), gender-disaggregated data show a gender disparity in enrollment rates; girls' enrollment rates in the program targeted counties fell below 50%, while boys maintain rates of 51%-63% (KY.MGD.Midterm.2016-2020). A comparison of baseline and midline data show a disconnect between higher enrollment, attendance, and improved attentiveness when comparing MGD schools with control schools and Home-Grown School Meals Program schools. Broadly, according to evaluation reports educational

Figure 1.4 Educational Outcomes in MGD Schools



Source: Authors using WFP information from the Final Evaluation of the 2014-2016

outcomes tend to decline when schools steadily transition to the HGSF model (KY.MGD.Midterm.2016-2020).

Health and Nutrition

MGD Project Phase 1 provided in-kind food commodities from 2004 to 2006, reaching an estimated 1.2 million learners annually during that time period--of which 48.0% were girls (Holland, 2021). Phase 2 of MGD project implementation brought school meals to 1,766 schools across ten targeted arid counties and unplanned settlements in Nairobi. Phase 2 impacted a little over 1.8 million school children by directly providing nutritious, hot meals (KY.MGD.Endline.2014-2016). Food storage and safety are a high priority for the MGD program. To avoid food contamination, MGD leveraged its partnership with the Kenyan Ministry of Health to deploy public health officers who conducted health education in beneficiary schools. Public health officers also inspected commodity storage facilities and beneficiary school kitchens to ensure compliance. Organizations, like UNICEF, worked to increase access to safe water, build gender-sensitive sanitation facilities, and implement hygiene education. To improve attendance for girls, UNICEF included menstrual hygiene management in schools. Similarly, World Vision (WV) provided sanitary products for girls to ensure school attendance.

MGD projects further worked to increase appropriate health and dietary practices in beneficiary schools by training teachers, cooks, and storekeepers on proper food storage and safety practices. Evaluation results indicate that 100% of food preparers in target schools achieved a passing score on a safe food preparation and storage test. Nevertheless, this did not translate into practice for all beneficiary schools as only 76.5% of schools in target communities store food off the ground as a food safety measure (KY.MGD.Endline.2014-2016).

An interview participant recounts the importance of school meals in reducing short-term hunger and nutrition among school children.

One of the other experiences that l have seen while I was in government is that the food they are given for lunch they will not eat all of it, the remainder they put it in the container and they go eat it in the evening, or his siblings don't remain hungry he goes and shares the little that he has with them at home. I was so shocked. (SEI with key informant, December 2021)

Other interview participants reiterated:

So we can talk about the successes. I can say that at least the program has been able to meet the daily (nutritional) needs of a child by a third, you know, a third of what a child needs has been met by this program. And we can say the program has successfully managed to meet short-term hunger and nutritional needs. (SEI with key informant, December 2021)

Another participant emphasized the importance of training on WASH under the program:

I told you we trained their school health patrons, and the school teacher feels it is part of the program to ensure that these WASH and nutrition information is actually taken up by the pupils. And of course, when the children go home, they replicate the good practices learned from school to engage their parents. Since as we all know, whatever the teacher says, takes precedence over what the parent says. (SEI with key informant, December 2021)

Value/Supply Chain

Target counties identified challenges with food storage and transportation to the schools as a prominent obstacle to achieving school feeding sustainability in beneficiary communities a. Interviews with stakeholders indicated that relying on the Sub-County Director of Education (SCDE) to transport food to schools frequently led to delays in delivery, reducing the number of days that the schools could provide meals. Some interviewees reported that head teachers have felt compelled to occasionally contribute their private funds to pay transporters to deliver the food products from the SCDE storage to the schools. Evaluation results revealed that "Sometimes when funds were low, payment was made by offering food products to the transporters instead of paying cash" (KY.MGD.Endline.2014-2016). Stakeholders, during an in-depth interview, shared their experience with supply chain challenges:

Some supply challenges arise when the government is handling the food deliveries. We would divide the quantities, WFP would deliver food in some areas up to the government warehouses in the counties, and the government would also deliver to other areas. So one of the challenges that we faced was a delay in the government counties where the government was to deliver food; there could be delays as they procure transporter services. WFP, of course, has a continuous transport register, but the government does not have that. So there would be delays. (SEI with key informant, December 2021)

Another participant noted that:

Of late, I have seen the need for Kenya to be supported more because sometimes things are not happening the way we would want them to happen. For example, procurement of food, transportation of food, the quality of food. Those are aspects that need to be done for us to continue working and establishment of coordination structures and the partnership. Yeah. (SEI with key informant, December 2021)

Another participant asserted that:

So my days in the field when we used to do the actual implementation. You know, logistics, road conditions, you know, like when it rains-no delivery of food. There is a challenge of security in some areas, and there are also issues of storage handling in terms of warehousing.

So for me the key challenge was roads it increases the costs of transport, in some areas getting reliable transporters, of course, that has improved a lot. The storage facilities would lead to some spoilage because even when we were implementing, remember we used to hand over the food to the government at the district level. The government used to transport from the district-level store. Now where they're called the counties from the county-level store with their schools. (SEI with key informant, December 2021)

As the Home-Grown School Meals Program is gradually adopted, timely and efficient delivery of food commodities for an affordable price is key to program success and sustainability; however, our interviews suggest that challenges, such as delays in school meal commodity delivery, poor storage capacity in some places, and inadequate food supplies persist, especially in Home-Grown School Meals Program schools.

"MGD Project Phase 1 provided in-kind food commodities from 2004 to 2006, reaching an estimated 1.2 million learners annually during that time period– of which 48.0% were girls (Holland, 2021)."

Partnerships for School Feeding in Kenya: The role of MGD in forming alliances

Since its inception, Kenya's school meal program has been the joint responsibility of the Kenyan government, the WFP, and other implementing partners. The Kenya Education Sector Support Program of 2005 (KESSP 2005) emphasizes the critical need to form and strengthen an active network of partnerships between the Kenyan government, UN agencies, and NGOs to support Kenya's school feeding program (Holland, 2021). The WFP-Kenya utilizes a multisector approach to program implementation and recognizes the vital role key government agencies must play in reaching project goals. The next section explores the different partnerships driving Kenya's school feeding program.

Partnerships with the Public Sector

The leading public institutions directly engaged in implementing the MGD program in Kenya include the Ministries of Education, Health, Agriculture, and Livestock and Fisheries; the National Treasury, and relevant ministries at the county-level (KY.MGD. Endline.2014-2016). Partnership networks and structures in the LRP project similarly emphasized relations with the Ministries of Education, Agriculture, Health and Industry, Trade, and Cooperatives. The inclusion of the Trade Ministry is an expansion of the network of partners engaged in the LRP project when compared to the partner networks mainly established by the WFP-Kenya during MGD program implementation. In Phase 3 of the program, the partnership structures and networks remained similar, with an emphasis on engaging and building the Kenyan government's institutional capacity. As of the midline of Phase 3, the Ministry of Education continues to lead implementation of the Home-Grown School Meals Program and facilitating the transition of the remaining schools from MGD managed to government-owned and administered. Further, other public agencies support this process with diverse contributions and roles (KY.MGD.Midterm.2016-2020, WFP, 2013). Table 1.3 lists some of the key partners in the public sector, engaged in the implementation of school feeding activities in Kenya.

In-depth interviews conducted with stakeholders, including the WFP staff and government staff, suggest there is mutual recognition of the critical role

Table 1.3 Summary of Partnerships With the Public Sector for School Feeding Under MGD Kenya

MGD/LRP PARTNERS FROM THE PUBLIC SECTOR	CONTRIBUTIONS TO SCHOOL FEEDING
Kenya Ministry of Education	They are responsible for the government-led HHome-grown School Meals Program. The ministry provides training, technical and financial support for the HGSM program.
Kenya Ministry of Health	They are responsible for the inspection of food quality, food safety, guide menu planning, and healthy dietary habits. The ministry of health is responsible for providing health education in beneficiary schools.
Ministry of Agriculture, Livestock, and Fisheries	They are responsible for promoting smallholder farmer access to school markets. Under the LRP component, the agriculture ministry facilitated market linkage, forums in the target area, introduced potential suppliers to the school meals procurement committees, and worked to enhance transparency
National Treasury	They worked to decentralize fund disbursement and allocation to the county-level.
Ministry of Industry, Trade & Cooperatives	They supported the implementation of the LRP component and conducted training on procurement for food traders and suppliers.
School Meals Committee	They are responsible for the administration and management of the HGSM program, including procurement, food preparation, and reporting school meal related outputs at the school-level
County Officials	They are responsible for supporting the government in HGSM planning, oversight, and monitoring.

Source: Partnerships Assessment Tool developed by authors from MGD documentation and interviews with key informants

partnerships can play in enhancing the implementation of a HGSF model program. A participant noted:

So the collaboration with the Ministry of Education started way back in 1980 when the government requested the WFP to provide food to 240,000 children in very arid areas. Then from that time, we started working hand in hand with the government, closely working with the government. At the very first stages, the program's design was WFP procuring and transporting food. But with time, it was realized that for purposes of sustainability, the government had to take more and more risk for the program. (SEI with key informant, December 2021)

The participant further noted:

…. So our collaboration has been very strong in the sense that, every year, we would do a partnership agreement with the government that outlined the responsibilities of WFP and the responsibilities of the Ministry of Education. This strong collaboration was very useful in ensuring that the transition in 2018 was successful. Yeah. Yeah, yeah. Go on. (SEI with key informant, December 2021)

Another participant (the WFP-Kenya) reiterating the role of the health ministry in the HGSF model implementation noted:

Another key partner is the Ministry of Health. Because within the school, there are certainly complementary activities undertaken by the Ministry of Health, particularly checking the quality of food, which is done by public health officers, as well as the nutrition aspects by the Ministry of Health. There are other functions like fortification of food, supplementation, vitamin A supplementation, and deworming; the ministry of health does all these. (SEI with key informant, December 2021)

Similarly, another participant notes (the WFP-Kenya staff):

Actually for the LRP, Ministry of Agriculture was a stronger partner than the Ministry of Education, because all these farm organization groups, capacity building of farm organizations, checking on crops was mainly by the Ministry of Agriculture. In fact, even procurement and when McGovern-Dole staff came to Kenya, we had meetings with the agriculture ministry more than the Ministry of Education. Because the Ministry of Education was providing the platform, was providing the market. But then a lot of work was being done by the ministry of agriculture. (SEI with key informant, December 2021)

Another participant noted:

Additionally, a key ministry has always been a Ministry of Agriculture because agriculture is the one that forms the link between the school and the smallholder farmers. Therefore, they would be responsible for capacity building farmers, establishing linkages with the smallholder farmers, establishing smallholder pharma organizations and continuous support to them. (SEI with key informant, December 2021)

Interviews with stakeholders further reveal that there have been efforts by project implementers to partner with higher research institutions; the respondent noted:

We also work with the university and research institutions like the universities, take part in testing about the fortification. So we have higher education… We have Kenyatta University. And also Jomo Kenyatta University. I think I know of those ones, and then in research institutions we work with KEMRI. (SEI with key informant, December 2021)

The organizational and institutional culture surrounding partnerships among critical institutions, including government and private agencies, remains positive and enables long and short-term interagency collaboration, and there exists a strong working relationship across agencies and with the WFP-Kenya. The interagency network provides a strong foundation for a multisectoral approach to solving the challenges of HGSF sustainably and inclusivity. Nevertheless, the necessary government ministries face some challenges implementing the Home-Grown School Meals Program; this includes delayed or inadequate funding and the unstable climate conditions, which cause fluctuation in the local availability and price of school feeding commodities. While the Ministry of Education plays a lead role in establishing and managing school feeding, which builds a strong foundation for sustainability, learning outcome data suggest that the Kenyan education ministry could face challenges to maintain current educational outcomes achieved by the WFP-Kenya under the MGD project implementation. Midline evaluation evidence points to a decline in literacy and numeracy rates and seven other key education outcomes monitored by MGD program projects (KY.MGD.Midterm.2016-2020, 2018).

Partnerships with the Private Sector

Phases 2 and 3 of MGD prioritized increasing public-private sector engagement in school-feeding programmatic efforts in Kenya. These outcomes are seen in two indicators in the second and final phases of the program. MGD Indicator 11 "Value of new USG commitments, and new public and private sector investments leveraged by USDA to support food security and nutrition," and MGD Indicator 12, "Number of public-private partnerships formed as a result of USDA assistance." The broader aim of increasing public and private sector investments was to mobilize private sector support for food security and nutrition efforts.

While the shift toward increasing public-private partnerships in targeted school meal programs in Kenya showed remarkable promise in terms of sustainability, the limited conceptualization of what constitutes a public-private partnership undermined the WFP's potential to leverage private sector resources to benefit their projects. According to the MGD program, "Public-private partnership is interpreted as referring to the number of traders contracted to supply food commodities to schools." This narrow conception inevitably restricted private-sector engagement to only refer to commodity traders (KY.MGD.Midterm.2016-2020). By Phase 3 (Midline), the WFP-Kenya had involved 81 commodity traders/suppliers and is on course to achieve its target by the end of project implementation. Evaluation findings suggest that the WFP-Kenya's partnerships with commodity suppliers were undermined by multiple internal and external challenges, including agroecological conditions, supply chain disruptions, and food transportation delays, uncertainty about the timing and volume of government disbursements, and limited local availability of commodities forcing traders to incur extra procurement (and overall food) costs by procuring from neighboring counties (KY.MGD.Midterm.2016-2020).

Despite the narrow conceptualization of what defines a public-private partnership, field activities suggest that there is ongoing engagement with private enterprises. A participant, during an in-depth interview provided this answer when asked if project implementers engaged in public-private partnerships:

Yeah, DSM, and they're the ones who had supported the micronutrient powders, and I think when you talk to the nutrition team, they will inform you that they are actually willing to build the capacity of the small and medium enterprises to ensure that their capacity is built in order to adhere to regulations on fortification, food safety. (SEI with key informant, December 2021)

One sector that provides an opportunity for private sector participation is food fortification, a participant (from the Kenyan education ministry) noted during an in-depth interview:

We also did a pilot of a partnership with the private sector that is DSM, and they supported the provision of micronutrient powders. And, we really encourage the government to be able to provide these micronutrient powders because this is just a small sachet that can actually provide up to 15 micronutrients. And if introduced to schools that are in the dry areas, then they would be able to meet the micronutrient needs of the children. (SEI with key informant, December 2021)

The transport and distribution sector is another sector that can be leveraged to enhance private sector participation in school feeding; a participant revealed:

And then also there are private sectors when it comes to the limited modality when the government procures the food and has to distribute to the schools. Of course, they don't do it themselves. They bring on private sector actors to distribute the food to the schools. you know the transporters, the warehousing, and then also if they are procuring the food themselves in the cash transfer modality….the private people come in, so yes from that angle. (SEI with key informant, December 2021)

Other key sectors rife with opportunities to create more private sector partnerships include smallholder farmers—the smallholder farming group—and traders active in the local supply chain; these local actors can help supply commodities required by the Home-Grown School Meals Program. A participant revealed:

For the meantime, I think we are not familiar with an initiative targeting the smallholder farmers as potential providers of this school meals program. (SEI with key informant, December 2021)

Private sector engagement can advance the Home-Grown School Meals Program, but it remains an untapped resource. Home-Grown School Meals Program should consider developing a private sector engagement model

that fosters public-private partnerships with financial and/or for-profit institutions and individuals and tailor these partnerships to help pre-finance school meals at the county-level and finance activities of relevant value chain actors. This is integral to resolving the supply challenges many school meal programs face. Even though school feeding programs have received financial support from private enterprises to the sum of $15,381,303 (USD) as captured by the MGD final evaluation of Phase 2 (KY. MGD.Endline.2014-2016), there is little profit-based partnership with formal institutions in the program.

Partnerships with the Non-profit Sector

Not-for-profit organizations have always been key actors in implementing school meal programming in Kenya; these organizations provide support ranging from direct involvement with implementation to financial and technical support. Notable nonprofit organizations in the school feeding space in Kenya include international non-profits, international intergovernmental agencies, and foreign donors. The list includes the WFP, Catholic Relief Services, UNICEF, FAO, Partnerships for Child Development, Feed the Children, Caritas Makeni, Feed the Future (USAID), World Vision, and other UN agencies.

A participant discussing the role of nonprofits in MGD program projects noted:

In the Kenyan context, WFP had a very healthy relationship with the other partners because as a European organization, you know they were relying on the strength of other organizations like NGOs to provide certain specific services actually where they could not reach. For instance, WFP sometimes used organizations like Feed The Children to provide school feeding programs. And they help WFP upscale and provide food to all the schools within their beneficiary's counties, especially in Nairobi because of the difficulty in reaching some of the slum schools. (SEI with key informant, December 2021)

The participant further noted:

So there are other partners that WFP was also using on the ground, like the Catholic Relief Services. I am proud that, actually, they were even using them in their

Table 1.4 Summary of Partnerships With the Nonprofit Sector for School Feeding Under MGD Kenya

MGD/LRP NONPROFIT PARTNERS	CONTRIBUTIONS TO SCHOOL MEALS PROGRAMS
UNICEF	They support the development, review, and implementation of educational policies, including disaster management, water, hygiene and sanitation, and education management information systems. UNICEF also provided support to increase access to safe water, gender-sensitive sanitation facilities, and hygiene education, including menstrual hygiene management in schools.
UNESCO	They work with government agencies to increase access to quality education.
Feed the Children (FTC) Kenya	FTC works in the informal settlements in Nairobi. FTC warehouses supplied food storage before distribution in Nairobi in the early stages of the project.
Partnership for Child Development (PCD)	PCD is a partner in Technical School Feeding Committee and provides advisory support to the program. PCD provides capacity building and support to program projects and helped develop the National School Health Policy.
Netherlands Development Organization (SNV)	SNV provides support in the areas of procurement and governance. They support farmers in accessing school markets, ensuring that procurement procedures are farmer-friendly, and the community is engaged. SNV is a member of the national-level Technical School Feeding Committee.
World Vision (WV)	WV provides health education on food and nutrition, water, and sanitation. WV provided sanitary products for girls to ensure school attendance.
Feed Kenya (Feed the Children)	They support food and nutrition education and health capacity building.
Welthungerhilfe (German Agro-Action)	They support agricultural activities in the MGD program project target areas.
Action Against Hunger/United States (AAH/USA)	They donated water tanks, built water reservoirs for rainwater tapping, provided energy-saving stoves, and drilled boreholes for the target schools and their communities.

Source: Partnerships Assessment Tool developed by authors from MGD documentation and interviews with key informant.

arid areas. For example, when there was a problem of transportation of food, maybe from the sub-county to the schools, sometimes, as you know, the Catholic Relief Services would come in and actually even support the provision and the transportation of food all the way up to the schools. Because sometimes, maybe the resources from the government could delay before it comes. It means that children could go without food, but the food is out there in sub-county. Catholic church also supported several other schools as one of its sponsors. So WFP had a very healthy relationship with other local organizations which are more humanitarian. (SEI with key informant, December 2021)

Stakeholders assert that the partnership strategy adopted by the MGD program has largely been successful; a participant noted:

The partnership that has worked very well is the partnership that we have had with WFP. Since WFP is a humanitarian organization, and because of their calling and objective, whatever they stood for, I think that is largely attributed to its success. However, we also have some partnerships which have also worked but in a short while. You know from the partnership that we have done with UNICEF, not necessary for food but other programs supporting education including WASH, to improve sanitation in schools, to provide handwashing facilities and in most primary schools that one has also been very successful. (SEI with key informant, December 2021)

The presence and activities of nonprofit organizations have significantly shaped Kenya's school meal program; these mutually reinforcing relationships have been sustained since the inception of MGD's school meal program projects, and there are indications that these partnerships will continue. For example, the WFP-Kenya has already launched its 2018-2023 country strategic plan and has committed to strengthening national and institutional capacity to implement the SDGs. Similar steps and commitments have been taken by other UN agencies and international nonprofit organizations.

Community-Based Partnerships

The shift from commodity distribution to cash transfers and the subsequent launch of Home-Grown School Meals Program modeled school feeding programs in 2009 highlighted an urgent need for community participation in two keyways: fostering accountability in how resources allocated to the programs are utilized; matching contributions from the government to support school feeding and as commodity suppliers/traders to the Home-Grown School Meals Program to enable local procurement. The WFP recognized the need for community-level partnerships and adopted measures to increase engagement with community leaders and farmer organizations. Community-level engagement is underpinned by the "Results indicator: Increased engagement of local organizations and community groups." The WFP —community partnerships have yielded an impact as participating communities provide financial and materials resources to their school meal programs. For example, evaluation results suggest that "on average, parents provide more than 80% of the water, firewood, cooking and eating utensils, cleaning products, and cook's salary; parents also made a daily financial contribution of between 5-30 KES" (KY.MGD. Endline.2014-2016). Another key role community actors play is ensuring accountability in how school meal resources are allocated and utilized at the school-level.

Participants during an in-depth interview asserted that:

In the homegrown school feeding design, the local communities are, one of the major roles that we look at is the provision of the food or the supply of food to the school. So we are looking at those farmers that organize small groups to bid and supply to the schools. That is one role. (SEI with key informant, December 2021)

The participant further noted:

The other role communities play is overseeing; overseeing that the project is implemented at the schools in the right way. I don't want to call them whistleblowers, but for the lack of a better word, I feel like they are counted on to be whistleblowers should they see something going amiss, or should they see government teachers ganging up to bring down a school feeding, you know, by maybe probably destroying the food or allowing the food to be stolen and all that. So we expect them to be the people that raise the alarm that hey, something is happening here down at our school. (SEI with key informant, December 2021)

The role of community participation in the program permeates multiple sectors and includes the schools; community members are key

members of their parent-teacher associations and have management responsibilities within the program. A participant during an interview noted:

And also there is also the role of the PTA, like we have said, to ensure at the school-level the implementation is done rightly. And the issue of accountability and transparency comes in at that level because they are key/ major players in ensuring there is accountability and transparency of the food that is at that school. (SEI with key informant, December 2021)

A participant from the WFP-Kenya reveals that the WFP strategically developed interventions aimed at encouraging community members and developing their capacity to participate in managing their respective school meal programs. The participant noted:

We also empower the community to manage the school feeding program or the school meals program, so we continue to have parent representatives. And we build their capacity on how to get involved in the implementation or management of the school meals program to ensure that the food is purchased. They look at the storage and all the accountability that goes with it; how much food should we expect? How much have we received? Yeah, that kind of a thing. (SEI with key informant, December 2021)

The co-production approach implemented in MGD projects succeeded in increasing community awareness, participation, and ownership of the Home-Grown School Meals Program in Kenya. Nevertheless, community material and financial contribution could exacerbate household food insecurity, primarily because community contributions to the Home-Grown School Meals Program disproportionately demanded women-controlled resources such as water, firewood, cooking skills, and utensils. Historically, women and girls are burdened with household labor and have limited access to economic resources. For example, FAO revealed that poor women in rural areas of developing countries generally experience time constraints compared to men due to their traditional socio-cultural roles. They spend long hours harvesting firewood and carrying water over long distances and cooking over smoky fires, jeopardizing their health in the process. The time and labor expended limits women's ability to engage in other income-generating activities (Lambrou & Piana, 2006).

Centering community contributions around essential material resources such as "water, firewood, cooking and eating utensils, cleaning products, and cook salaries deplete women-controlled resources that are necessary for household survival. The increasing possibility of depletion of women-controlled resources by the school meals programs could have a debilitating effect on household income and fiscal resiliency, adversely affecting school attendance for children from vulnerable households. The final evaluation results Phase 2 present evidence of the potential adverse effects of women-centered contributions on school meal programs; for example, a key informant interview with teachers during Phase 2's final evaluation reveals:

"Centering community contributions around essential material resources such as "water, irewood, cooking and eating utensils, cleaning products, and cook salaries deplete women-controlled resources that are necessary for household survival."

In many cases, parents ask their children to collect the water and firewood on the way to school. Teachers noted that this often adversely affects attendance, with students coming late to school. (KY.MGD.Endline.2014-2016)

While community contributions may produce immediate. short-term positive results, these contributions pose a challenge to school meal program sustainability and could further worsen women and household poverty.

Partnership Sustainability in Kenya's School Meals Program

The HGSF model, and associated school feeding program, is a bold step toward transferring the current donor-driven school meals program to the government of Kenya, and the multisectoral partnership approach witnessed during project implementation has been key to its success. Strong public sector engagement, the role of nonprofits, and the growing inclusion of the private sector in the implementation process are positive developments that continue to yield positive results in reducing short-term hunger and improving child education. However, initial lessons drawn from the implementation of the LRP project and the Home-Grown School Meals Program provide a glimpse of the potential challenges

that government-owned and administered programs may face after full transition from donor-led structures.

Public-private partnerships within the context of the MGD program remain underutilized and remain limited to partnerships between commodity traders and suppliers. The first step toward improving private sector participation is to broaden the definition of private-sector partnership to encompass financial institutions, transporters, individuals, and/or formal businesses that are ready to pre-finance the provision of meals at the county-level for a profit. Potential areas to further facilitate public-private partnerships include food fortification, transportation, storage, and distribution.

MGD, under the HGSF model, adopted a co-production approach, especially at the community-level. Boyle & Harris (2009) defined co-production as " delivering public services in an equal and reciprocal relationship between professionals, people using services, their families and their neighbors. Where activities are co-produced in this way, both services and neighborhoods become far more effective agents of change" (p. 11). The co-production approach adopted by the WFP-Kenya under the MGD program made communities more responsive and yielded almost immediate results for the Home-Grown School Meals Program. Nevertheless, co-production as an approach has its own disadvantages. For example, Bovaird & Loeffler (2012) reveal that co-production thrives on reciprocity, requires strong social networks, and is prone to issues related to funding barriers.

Furthermore, the WFP's partnerships with communities often requires communities to make financial and material contributions to their respective school feeding programs; this approach, based on evaluation findings, is unsustainable. The financial and material contributions (of mostly women-centered resources) from participating households deplete vital household economic resources and can exacerbate household vulnerability to food insecurity, especially for more financially fragile households. This approach also burdens women by diverting time and resources critical to the survival of their households. Further, this diversion of resources could affect children's school attendance, especially among girls, from poor households. Children from households who may not be able to meet the financial demands of the program could experience an increased risk of dropping out of school.

Kenya's public agencies and their partnerships with the nonprofit community made it possible for the Kenyan government to access the needed financial and technical resources to shape policy and enable direct investment in school feeding. These types of partnerships have been adapted to support the creation of the Kenyan School Meals Program. The autonomous nature of nonprofit institutions has been integral in motivating and holding the government accountable for its commitment to their own school meal programming. Kenya's school meal program and its partnerships with nonprofit organizations have been sustainable so far and are required for the transition into the next phase. Overall, in the WFP-Kenya through the MGD program and LRP project has successfully fostered and identified the right partners across sectors. Still, there remains a need to increase investment in and attraction of private enterprises for pre-financing Kenyan school meals programs at the county-level. As a social protection measure, the WFP should consider a selective application of the co-production approach at the community-level, especially in arid and semi-arid areas.

Analysis of School Feeding Partnerships in Rwanda

Institutional Framework for School Feeding

Socio-economic and Policy Context

Nutrition and Food Security

Rwanda is a landlocked country located in East Africa with a population of 12,955,736 as of 2021, according to the National Institute of Statistics of Rwanda-NISR population projections (NISR, 2014). Over the past decade, Rwanda has shown some improvement in the well-being of the general population. Data from the Rwanda Demographic and Health Surveys (RDHS) show that infant mortality decreased from 107 deaths per 1,000 live births in the year 2000 to 33 deaths in 2019-20, and under-5 mortality decreased from 196 deaths to 45 deaths in that same period (NISR, 2020). Similarly, the nutritional status of children under five shows some improvement, with stunting decreasing from 48% in 2000 to 33% in 2019-20, underweight from 20% in 2000 to 8% in 2019-20, and wasting from 8% in 2000 to 1% in 2019-20 (NISR, 2020).

Despite improvements in child nutritional status in Rwanda, a disproportionately high percentage (37%) of anemic children are reported (WFP, 2019). Further, findings from the WFP's Fill the Nutrient Gap report for Rwanda suggest that "despite significant improvements, malnutrition remains the number one risk factor for disease in Rwanda." (WFP, 2019, p. 6) Aspects that raise concern include lack of dietary diversity due to high reliability on staple foods and limited access to animal protein sources; high levels of stunting and anemia among children; problematic water, sanitation and hygiene (WASH) conditions, mostly in rural areas; barriers to adequate infant and young child feeding (IYCF) due to limited availability and affordability of nutritious foods, limited income, cultural expectations around feeding; and the socio-economic status of mothers and caregivers (WFP, 2019). In addition, gender disparities remain a relevant problem that leads to poor population-level health outcomes. For instance, low female enrollment in secondary school remains high. This is problematic because of the linkage between maternal education levels and child nutritional outcomes (Negash, et al., 2015, Kabubo-Mariara, et al. 2009).

In terms of economic development, agriculture in Rwanda is the most important economic sector, accounting for 30% of the GDP and 70% of employment (RDB, 2022), using 60% of the country's land (NISR, 2021). Seventy-seven percent of agricultural land is devoted to seasonal crops, and the remaining is devoted to permanent crops. Rwanda has three agricultural seasons: Season A, from September to February; Season B, from March to June 2021; and Season C, from July to September. Larger crops (by area and yield) include maize, sorghum, cassava, bananas, and beans (NISR, 2021). Despite improvements in productivity due to increased use of agricultural inputs supported by government initiatives, productivity levels remain low. This can be attributed to weak productive systems and value chains characterized by high reliance on rainfed systems, inefficient use of improved agricultural techniques, limited access to technologies and markets, and

the limited capacity of smallholder farmers (e.g., poverty, limited access to credit, small plot sizes) (FAO, n.d., Semi-structured interview with WFP-Rwanda staff, June 2021).

According to WFP (2019), low crop yields and livestock production negatively impact farming income in Rwanda which, in turn, further hinder access to adequate nutrition. Data (2018) from the Comprehensive Food Security and Vulnerability Analysis (CFSVA) shows 44.3% (31.2% in urban areas and 47.2% in rural areas) of surveyed households were experiencing food insecurity. Survey results were even more concerning in districts where WFP is implementing the MGD program; the districts of Nyamagabe (71.1%), Burera (65.2%), Nyaruguru (61.5%), Rutsiro (56%), Karongi (50.4), and Kayonza (46.7%) reportedly experience higher than average food insecurity (WFP, 2018).

Education

Education in Rwanda improved in terms of student enrollment, as shown by data collected by the Rwandan Ministry of Education (2020). Between the years 2017 and 2019, enrollment increased from 3.6 million students (2017) to 3.7 million (2019) at all educational categories. Nevertheless, enrollment in primary education (years 1-6) showed a slight decrease to 2,512,465 students (2019) from 2,540,374 (2017; see Table 1.15). Other indicators showed both improvement in areas such as promotion rate (increased from 80% in 2017 to 82.2% in 2018) and repetition rate (decreased from 13.4% in 2017 to 10% in 2018). Even so, the primary school dropout rate grew from 6.7% in 2017 to 7.8% in 2018. Both, repetition and dropout rates are higher among male students (10.9% in 2018/19) than female students (9.2% in 2018/19) and while the transition from primary to lower secondary school rate has shown an overall improvement (from 71.1% in 2015/16 to 72.2% in 2018/19), improvements for female students are higher (from 70.4% in 2015/16 to 72.4% in 2018/19) when compared to male students (from 72% in 2015/16 to 72.1% in 2018/19; Ministry of Education of Rwanda, 2020).

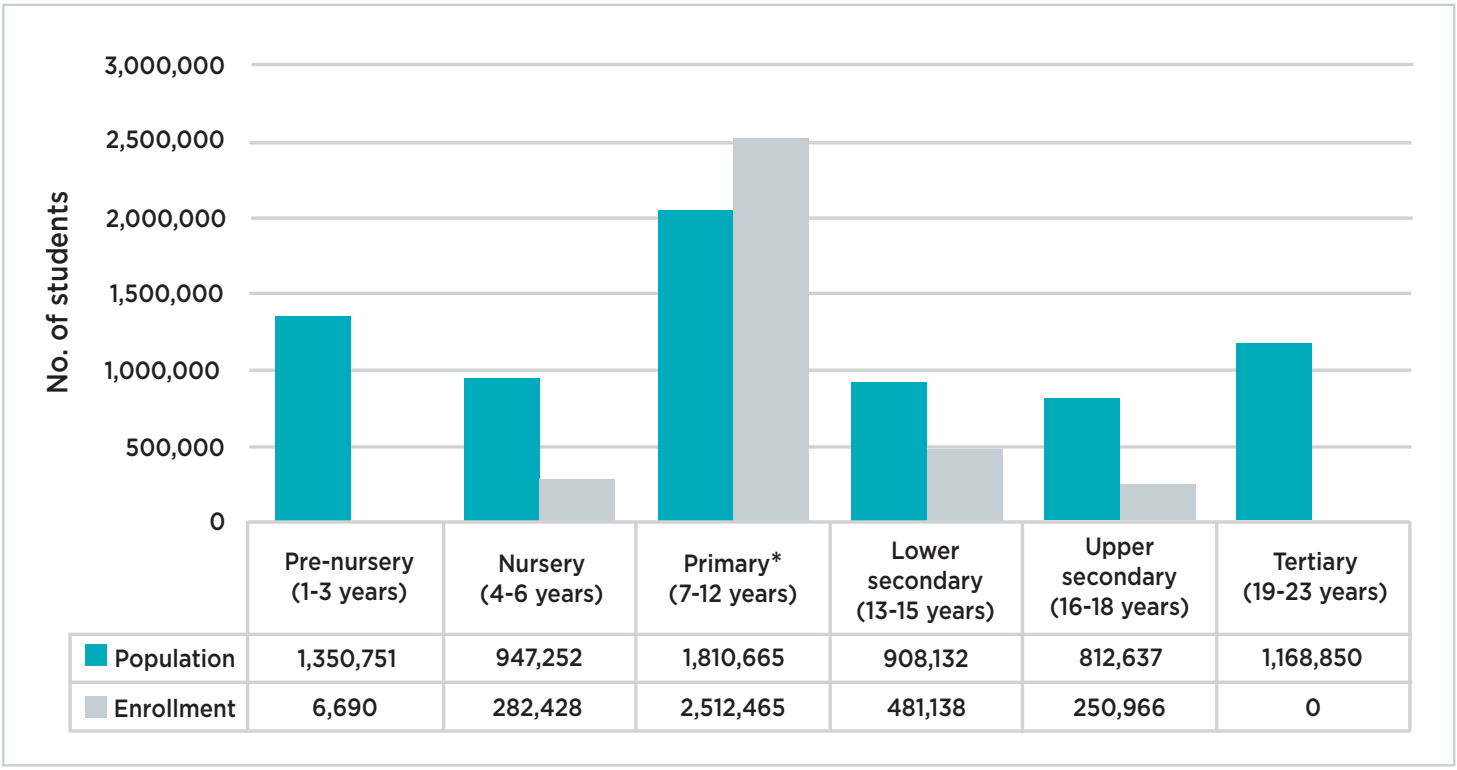
Ministry of Education data (2020) also show that participation rates for all educational categories are low, with the exception of primary education. While primary education enrollment is higher than its corresponding population age group (7 to 12 years old), official data include all students enrolled within that category regardless of their age (see Figure 1). This means that the proportion of the population between 1 and 6 years old and over 13 years old have educational deficits. Those under 6 years old could greatly benefit from enhanced access to early childhood education, which would improve child cognitive and social development and educational

Table 1.5 Rwanda—Number of students per category

Category	Number of students enrolled		
	2017	2018	2019
Pre-nursery	**5,234**	**6,491**	**6,690**
Nursery	**220,435**	**226,706**	**282,428**
Primary	**2,540,374**	**2,503,705**	**2,512,465**
Lower secondary	382,661	422,093	481,138
General upper secondary	139,319	147,618	158,489
TVET level 1 to 5	79,595	79,388	83,157
TTC	9,397	9,186	9,320
TVET level 6 to 7	10,420	13,447	14,078
Higher education	80,773	75,713	72,128
TVET NEP	17,486	9,650	9,932
Adult literacy	152,015	132,365	123,607
TOTAL	**3,637,709**	**3,626,362**	**3,753,432**

Source: Rwanda 2019 Education Statistics (Ministry of Education of Rwanda, 2020)

Figure 1.5. Rwanda — 2019 Student Enrollment as proportion of population (Within official age range)



Source: Authors using WFP information from RW.MGD.Endline.2016-2021

[*]The higher enrollment in primary education is higher than the official count for population under the 7-12 years age range.The report explains that the reported numer includes all students enrolled, regardless of the age.

and overall life outcomes (Shonkoff & Phillips, 2000). Efforts to improve the quality of education in the early stages also include school feeding programming.

Given the important role human development plays in the country's well-being, the Government of Rwanda has increased efforts to support school feeding programs in nurseries and primary schools. Data available in Table 1.6 shows a significant growth in the number of nurseries participating in school feeding initiatives (increased from 273 in 2016 to 1,277 in 2019); important growth is also seen in primary school participation, which doubled between the same reporting period (from 231 to 504). The number of students from participating nurseries saw

Table 1.6 Rwanda—Participation of nurseries and primary schools in School Feeding Initiatives, 2016-2019

INDICATOR/YEAR	Nurseries				Primary Schools			
	2016	2017	2018	2019	2016	2017	2018	2019
Number of schools participating in school feeding	273	379	625	1,277	231	357	372	504
% of schools participating in school feeding	9.9%	11.9%	19.5%	37.5%	8%	12%	13%	17%
Number of schools with nutrition garden	242	314	440	528	1,105	1,173	1,173	1,123
% of schools with nutrition garden	8%	9.9%	13.7%	15.5%	39%	41%	40%	41%
Number of students fed at school	24,948	33,944	49,401	104,494	104,944	183,310	183,310	182,678

Source: Rwanda 2019 Education Statistics (Ministry of Education of Rwanda, 2020)

a fourfold increase between 2016 and 2019, while the number of primary students fed also steadily increased (see Table 1.6). Despite this growth, the percentage of students fed by government-funded programs in early childhood and primary schools remains comparatively low when considering enrollment and population size.

While the above sections suggest that the nutrition and educational context is integral to understanding school feeding, the following section examines the role Rwanda's policy context plays in school feeding implementation.

Policy Framework for School Feeding in Rwanda

To understand the institutional framework for school feeding programs, we conducted a review of policies that impact school feeding programming in Rwanda. Our policy review includes an overview of 38 Rwandan policy documents formulated between 1998 and 2021. Policies were classified by sector (depending on the lead entity that produced the policy) under the following categories: [1] National Strategic Plans, including intergovernmental organization country strategic plans, [2] Education, [3] Health and Nutrition, and [4] Agriculture. A total of 21 documents were identified as relevant for school feeding programming in Rwanda. This review is by no means an exhaustive list, but it does spotlight the many projects taking place.

Sectoral Policies

National Strategic Plans

The executives of Rwanda launched Rwanda Vision 2020 in 2000 and Rwanda Vision 2050 in 2015 as long-term strategic plans to transform the country's path toward human and economic development. Rwanda Vision 2020 includes 3 objectives: [1] Macroeconomic stability and wealth creation to reduce aid dependency, [2] Structural economic transformation, and [3] Creating a productive middle class and fostering entrepreneurship. To achieve these goals, the plan included six pillars. Among those, pillar No. 2— Human Resource Development and a Knowledge-based Economy— includes education-related actions. Under the education component, there are efforts to ensure Universal Education for all, following Millennium Development Goal 2. Some relevant targets under that component include "gross primary school enrollment (100%)" and "improve literacy rates (100%)". Later in 2015, the government launched Rwanda Vision 2050, seeking to promote economic growth and high quality of life for Rwandans. The strategic plan includes five pillars, the most relevant being "Human Development". This targets universal access to high-quality education and universal access to high-quality healthcare, which includes nutrition targets.

In 2007, following the strategic direction of Rwanda Vision 2020, the government formulated the Economic Development and Poverty Reduction Strategy (EDPRS, 2008-2012). The EDPRS strives to reduce chronic and acute macronutrient malnutrition and prevalence of micronutrient deficiencies and achieve universal primary education, which included improvements in literacy, enrollment, and completion rates. Another related goal includes further decentralizing funds districts use to cover teachers' salaries, school feeding, construction, and a capitation grant, because district implementation and M&E capacity has strengthened. The EDPRS, 2013-2018, released in 2013, includes a strategy to address poor maternal, infant, and child feeding practices through coordinated, strengthened, and scaled-up community-based nutrition programs and information campaigns across the country. This involves: [i] agriculture and social protection interventions that should reach the most vulnerable children through school feeding programs—like One Cup of Milk per Child; [ii] biofortification programs that will bio-fortify food; and [iii] strengthening the food security information system.

Following the tenets of Rwanda Vision 2050, the National Strategy for Transformation 2017- 2024 (NST 1) proposed a set of national medium-term development strategies. The NST1 includes three pillars of development, with the most important being social transformation. Under the social transformation pillar, priority area No. 2 seeks to eradicate malnutrition. Specific interventions under this priority area include: [i] Strengthening multi-sectoral coordination through the Nutrition Secretariat and strengthening the social cluster coordination at decentralized levels up to the village; [ii] Ensuring and sustaining food security (covered under the Economic Transformation pillar) and distributing food and vitamin supplements using Fortified Blended Food (FBF) and One Cup of Milk per Child to those already affected; and [iii] Promoting 1,000 days of good nutrition and antenatal care at the village level. This involves sensitizing households on good nutrition and

hygiene practices at the household and community levels using Early Childhood Development Centers (ECDs), health centers, and family-based campaigns.

In the intergovernmental sphere, the United Nations (UN) released the Rwanda United Nations Development Assistance Plan 2013–2018 (2013). According to this plan, the UN will support the design and delivery of social assistance programs for the most vulnerable through support of national social protection programs, such as Vision 2020, and through piloting an HGSF program. The UN is devoted to providing technical and financial assistance to prototype development, implementation, and scaling of HGSF. Following this global support, the WFP (2018) published the Rwanda Country Strategic Plan (2019-2023) which designed a series of strategic outcomes, including outcome No. 2 "vulnerable populations in food-insecure communities and areas have improved access to adequate and nutritious food all year." Expected outcomes include [1] Pre-school and schoolchildren in targeted areas receiving a daily nutritious meal that contributes to basic food and nutrition needs, increased attendance, and retention, and [2] Pre-school and schoolchildren in targeted areas benefit from the government's improved capacity to provide a nationally owned nutrition-sensitive school meals program.

Education

Rwanda's education sector is led by the Ministry of Education. In 1998, four years after the end of the genocide, the Government of Rwanda adopted the Education Sector Policy with an emergency focus. Leveraging results from the 1998 policy, the 2003 Education Sector Policy emphasized Universal Primary Education and Education for All. The policy follows the strategic principles established in Vision 2020 and poverty reduction strategies. The 2003 policy emphasizes implementing strategies to enhance the availability of Early Childhood Care and Development (ECCD) through technical support and incentives provided to the private sector to then provide ECCD services; at that time, these services were not provided by the public sector. It also underlines the importance of access to quality primary education, with a focus on improving enrollment while reducing dropout and repetition rates; enhancing gender-balanced access to primary education; reviewing curriculum to improve learning outcomes; enhancing the teacher/student ratio; and rehabilitating school infrastructure.

Education policy efforts later turned to education sector strategic plans. Of these three plans, the latest version (Education Sector Strategic Plan (2018/2019-2023/2024) includes as one of its cross-cutting issues "School health, hygiene, environmental protection, and climate change," under which the government will develop a national school feeding/gardening program that is owned by communities and include the provision of milk to primary pupils. It states that these actions will be achieved in collaboration with the Ministry of Agriculture, development partners, and district-level governing bodies. In terms of budget, funds for school feeding should come from earmarked funds (earmarked on or after 2014/2015) in the central government's budget. The Education Sector Strategic Plans also acknowledge that school feeding is a multi-sectoral and multi-level issue. The plans define ministry roles so that the Ministry of Agriculture is responsible for issues relating to school feeding and provision of milk to primary school students, the Ministry of Health for educational programs with health and nutrition components, and the Ministry of Gender and Family Promotion for education for girls. At the district level, the Strategic Plan describes the key roles and responsibilities of the District Education Officers (DEOs) (decentralized levels of government) as monitoring school financial reports, teachers' salaries, and school feeding and usage of capitation grants.

In the early 2010s, interest in early childhood development increased leading to its renewed inclusion in the Rwandan policy agenda. In 2011, the Ministry of Education, on behalf of the Government of Rwanda, released the Early Childhood Development (ECD) Policy. One of its expected strategic outcomes states "Increase equitable access for all children aged 0-6 to adequate early stimulation, effective and relevant education, sufficient nutrition, quality health care and protection." Actions related to these strategic nutrition outcomes include support of an Early Childhood Nutrition Program. In terms of collaboration, the policy highlights partnerships with the UN, multilateral and bilateral donors, and international NGOs in aims to obtain support to create Integrated ECD centers across the country in anticipation of future support and capacity increase being supplied by government contributions. Types of support included, but was not limited to, financial and technical assistance, monetized food contributions, pre-primary school feeding services, and increases in education partnerships for teacher training.

Health and Nutrition

The Ministry of Health is the agency in charge of the health sector, and it has assumed a leadership role in nutrition policy design. In 2005, the Government of Rwanda launched the Health Sector Strategic Plan 2005-2009. Regarding nutrition, the plan addressed governmental interests in designing and adopting a national nutrition policy to coordinate multisectoral efforts addressing nutrition in Rwanda. Under the Health Sector Strategic Plan framework, the Ministry of Health released the 2007 National Nutrition Policy (NNP). At the time, the NNP was considered as "the fundamental tool to guide the establishment of priority strategic directions in nutrition matters and to ensure effective advocacy to mobilize the human, material, and financial resources required for the program 's realization of the government's short-term and long-term nutrition" (p. 10). The general objective of the 2007 NNP was "to improve the nutritional status of the Rwandan people" (p. 19). Major policy highlights include the call to develop and adopt protocols for managing malnutrition, the need to promote IYCNF, and the scaling up of district-level, community-based nutrition programs (CBNP). For school feeding, the policy prioritized expanding food provision to more schools and opening school canteens. The policy also emphasized developing strategies to ensure access to supplementation of micronutrient fortified staples to reduce acute malnutrition.

"Strategic Direction 5 (from the National Food and Nutrition Policy, 2013-18) is to "strengthen nutrition education in schools and higher learning institutions through curricular and extracurricular activities." This direction is associated with and supports the food and nutrition elements of the Ministry of Education's School Health Policy. This cross-sector collaboration continues supporting efforts to implement school feeding through the HGSF"

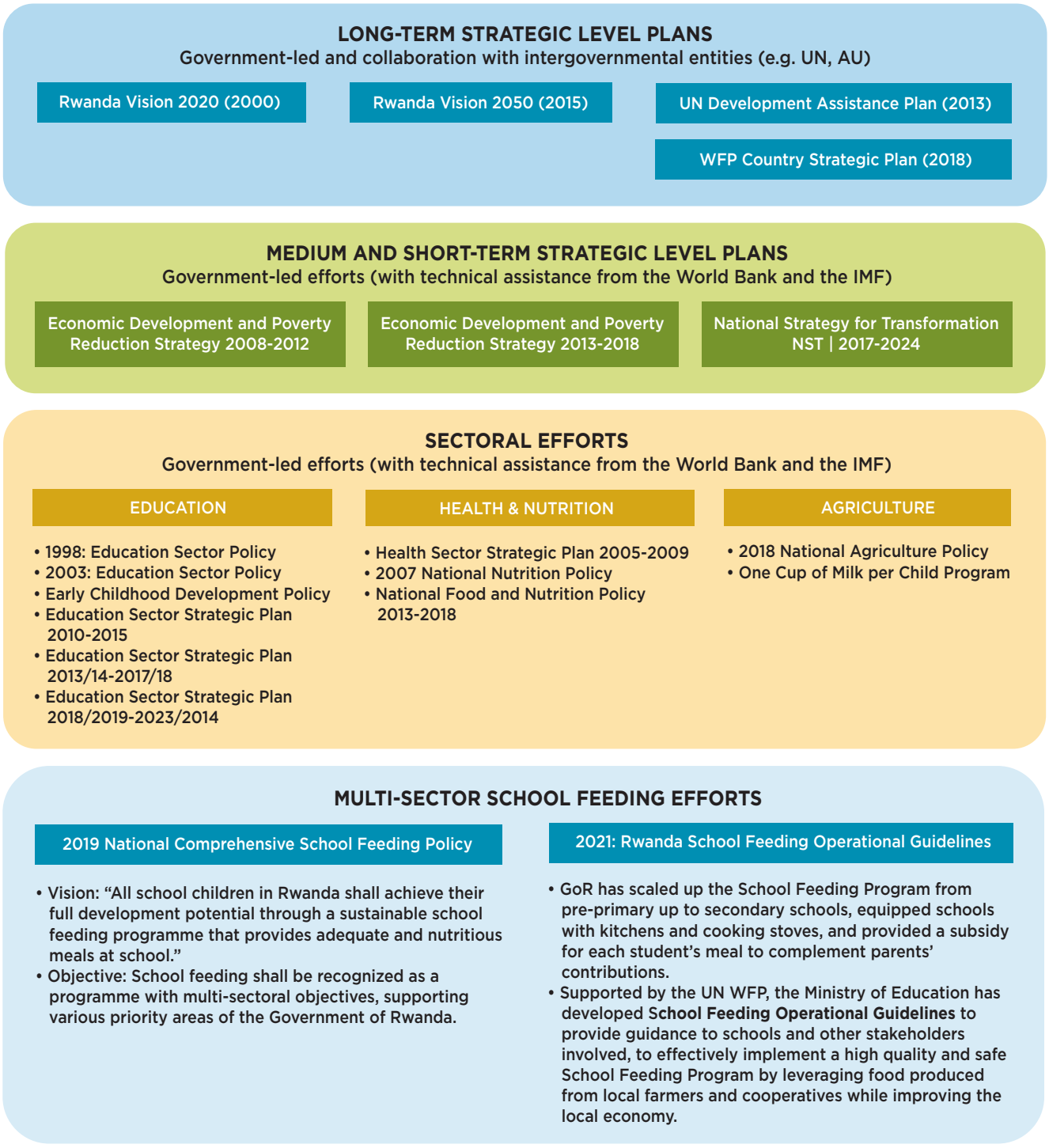
The National Food and Nutrition Policy, 2013-2018 was released by the Government of Rwanda in 2014. It includes seven strategic directions, of which Strategic Direction 5 is to "strengthen nutrition education in schools and higher learning institutions through curricular and extracurricular activities." This direction is associated with and supports the food and nutrition elements of the Ministry of Education's School Health Policy. This cross-sector collaboration continues supporting efforts to implement school feeding through the HGSF; sustains and expands existing school feeding programs (e.g. provision of meals to students in secondary schools, the Cup of Milk program for children in pre and primary schools, (described below) currently carried out in collaboration with the Ministry of Agriculture); improves learning about food security and nutrition in schools by strengthening the curriculum and extracurricular activities like the use of gardening and small livestock as teaching and learning resources; and expands school-based health and nutrition assessment and services (e.g., deworming and Vitamin A supplementation in collaboration with the Ministry of Health).

Agriculture

The Ministry of Agriculture and Animal Resources is the lead agency for the agricultural sector in Rwanda. The Ministry launched the National Agriculture Policy in 2018, whose main goal is "to ensure food and nutrition security of Rwandans by using modern agribusiness technologies, professionalizing farmers in terms of production, commercialization outputs, and the creation a competitive agricultural sector" (p. 13). The policy is structured around four pillars. Pillar 4, "Inclusive Markets and Off-Farm Opportunities" seeks to "improve productivity and inclusiveness of agricultural market systems and increase off-farm opportunities and competitiveness of diversified agricultural products for domestic, regional, and international markets. Moreover, the objective is to promote reliable access to affordable and healthy diets for the Rwandan consumer and to meet national objectives on poverty reduction, food security, and nutrition." The policy highlights the importance of local procurement of diversified nutritious foods for school meals to promote nutrition and healthy diets. Also relevant to school feeding programing is the policy's focus on developing and strengthening public-private partnerships that focus on smallholder farmer capacity building.

Figure 1.6 summarizes the Rwandan policy framework for school feeding.

Figure 1.6 Rwanda — Policy framework for School Feeding Programming



Source: Authors

School Feeding Policies: Cross-sector and cross-level collaborations

The previous section highlighted policy-level activities, from a sectoral standpoint, that include nutrition efforts targeting school-aged children in Rwanda. In this section, the report highlights recent accomplishments in the field of school feeding policy. Findings from the policy section undergird some of the information reported here.

Two major school feeding programs are currently implemented in Rwanda: the One Cup of Milk per Child Program and the government-funded school feeding program for students in secondary schools. In 2010, the Government of Rwanda, through the Ministry of Agriculture, established the One Cup of Milk per Child Program, a government-funded program that targets children attending school. This program aims to reduce malnutrition, promote retention of children

attending pre and primary schools, and enhance brain development among school-aged children. Officially scaled up and implemented in 2011, the 2010 pilot of this program benefited 21,300 children. As of 2013, more than 83,575 children reportedly benefited from this program (One Cup of Milk per Child Program, 2013). Another school feeding effort is Rwanda's Ministry of Education and parent-supported school feeding program implementing in public and government-aided secondary schools—also called the Secondary School Feeding Program. This program mostly relies on parents' in-kind and cash contributions, but the Government of Rwanda does supplement parents' contributions with their own funds. The two government programs are ongoing with plans to increase government funding and coverage (National Comprehensive School Feeding Policy, 2019).

The presence of WFP-Rwanda through the MGD and HGSF efforts has resulted in an important policy process with two relevant concrete outcomes: the 2019 National Comprehensive School Feeding Policy (NCSFP) and the 2021 Rwanda School Feeding Operational Guidelines. With the advent of this policy framework, the national school feeding program began in late 2020. NCSFP envisions, "All school children in Rwanda shall achieve their full development potential through a sustainable school feeding program that provides adequate and nutritious meals at school" (p. 9). NCSFP targets students in pre-primary, primary, and secondary schools. The policy acknowledges that school feeding is a multi-sector program that supports key development goals of the Rwandan government such as the Universal Primary School and School for All. The policy includes short, medium, and long-term objectives, as detailed in Table 1.7.

The policy identifies a series of actors and describes their responsibilities in the implementation of school feeding activities. The Ministry of Education leads the coordination, management, implementation, and monitoring of the school feeding program; it is also responsible for the provision of guidelines for the implementation and development of a structure for school feeding capacity building. Furthermore, the Ministry of Finance and Economic Planning is responsible for budgetary matters, including the identification of funding sources within the government budget, allocation of resources, and facilitation of resource mobilization from the private sector and international donors. The Ministry of Agriculture is responsible for creating the framework for the value chain for local farmers, contributing to the implementation of capacity building and financing local farmers, assisting with the extension of livestock resources in schools, and helping scale up the One Cup of Milk per Child Program by strengthening the supply chain of milk. The Ministry

Table 1.7 Rwanda - National Comprehensive School Feeding Policy Objectives Across Time

SHORT-TERM OBJECTIVES	MEDIUM-TERM OBJECTIVES	LONG-TERM OBJECTIVES
• To provide nutritionally sufficient food complemented by health and nutritional interventions to all school children; • To enhance enrollment, reduce absenteeism and improve the concentration span of the school-going children; • To provide a stable and predictable market to local farmers through increased demand for local food commodities; and • To improve skills and knowledge of parents, teachers, students and smallholder farmers on food productions,processing and preparation.	• To increase equitable access to education ensuring vulnerable children e.g. orphans and vulnerable children (OVCs) and children from poor households are targeted; • To improve on learning capabilities, cognition, performance and completion rates; • To enhance productivity through improved food production, processing, storage, food quality and safety; and • To reduce both parents' and government spending on education and medical care costs.	• To have a healthier and better qualified workforce, and better parents for the next generations; • To improve social equality and equity; • To enhance high quality local economic productivity; and • To break the intergenerational cycle of hunger.

Source: National Comprehensive School Feeding Policy (2019, p. 9)

of Health supports complementary health and nutrition interventions. Other government entities engaged in the implementation of the NCSFP include the Ministry of Infrastructure, Ministry of Gender and Family Promotion, Ministry of Local Government, Ministry of Trade and Industry, and development partners. Regarding the role of development partners, the policy states, "initiatives supported by development partners shall have a clear exit strategy with a program for handover to the government. Such a process shall ensure sustainability" (p. 25).

WFP has provided technical and financial assistance for school feeding program development in Rwanda. A significant outcome of this collaboration is the "Rwanda School Feeding Operational Guidelines" released in 2021. According to the Ministry of Education, the document "provides guidance to schools and other stakeholders involved, to effectively implement a high quality and safe School Feeding Program by leveraging food produced from local farmers and cooperatives while improving the local economy" (Rwanda School Feeding Operational Guidelines, 2021, p. 2). Current school feeding policy objectives emphasize the need to both maintain and scale-up current school feeding efforts to increase program coverage and the overall amount of school children who have access to school meals.

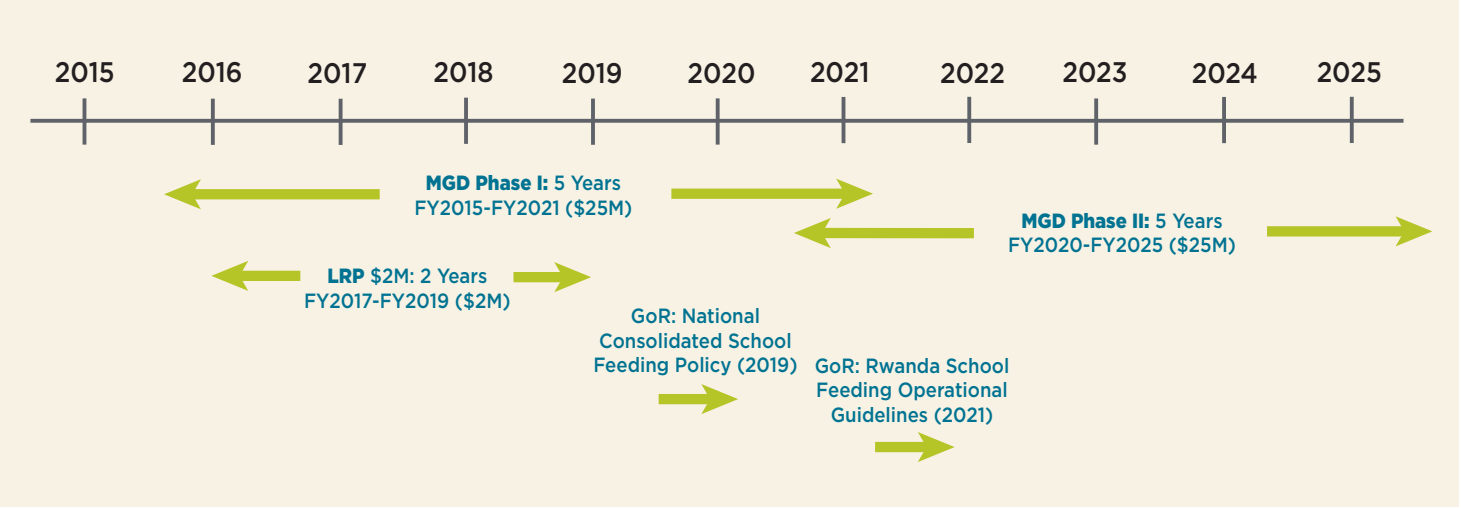
McGovern-Dole Food for Education Program implementation in Rwanda

The WFP in Rwanda

One of the earliest WFP-Rwanda-supported school feeding programmatic efforts in Rwanda began in 2002 in response to drought occurring that same year—the Southern Africa Regional drought. Many areas already suffering with some of the highest levels of food insecurity and poverty (i.e., Nyaruguru, Nyamagabe, Karongi, and Rutsiro districts) experienced an increased need. To respond, the WFP-Rwanda funded and implemented a school feeding program in these regions (National Comprehensive School Feeding Policy, 2019). Efforts to establish a large-scale HGSF program continued in 2015 with Phase 1 (2015-2021) of the MGD program implemented by the WFP-Rwanda. The WFP has provided technical expertise and knowledge derived from its own HGSF framework (FAO & WFP, 2018), which, along with MGD efforts, resulted in the development of a policy framework to implement a national school feeding program in Rwanda, as described in the previous section.

The MGD program in Rwanda aims to improve the literacy of school-age children and increase the use of health, nutrition, and dietary practices in pre-primary and primary school children. Broadly speaking, programmatic efforts include a comprehensive set of strategies for school feeding including the procurement of food from imported in-kind commodities, educational activities, and health and nutrition-related activities. MGD project implementation in Rwanda consists of two phases each comprising of 5-year awards for $25M; the implementation period for Phase 1 took place from fiscal year 2015 to fiscal year 2021 (i.e., October FY2015- September FY2021), and Phase 2 is expected to be implemented between FY2020-FY2025. Under the MGD implementation framework, USDA-FAS (in 2016) added efforts to develop local school feeding capacity under an LRP program in Rwanda. In the long run, the implementation of MGD projects in Rwanda seeks to ensure capacity for school feeding through its main partner, the Government of Rwanda's Ministry of Education. If local capacity is achieved, the WFP can "pass off" school feeding responsibilities to the government and "graduate" the program into their own, state-owned HGSF program (FAO & WFP, 2018). In 2019, the Government of Rwanda officially named WFP as its primary partner in the development of government-led school feeding. The first phase of the MGD school feeding project mainly focused on establishing the parameters for school feeding in Rwandan primary schools; the second (current) phase focuses on building HGSF capacity in those schools that serve as model schools for the national school feeding program (Figure 1.7).

Figure 1.7 Rwanda — School Feeding Efforts Led by the WFP and Supported by MGD



Source: Authors based on desk review of MGD program implementation in Rwanda

Programmatic updates: From handing over to developing Model Schools

Phase 1's MGD project covers the FY2015-FY2021 implementation period and targeted 108 schools in the four districts with the highest levels of poverty and food insecurity in Rwanda: Nyamagabe, Nyaruguru, Karongi, and Rutsiro (Figure 1.8). Consistent with the MGD program's strategic objectives, [1] improved literacy of school-aged children and [2] increased use of health and dietary practices, the WFP-led implementation in Rwanda included school feeding, education, WASH, health and nutrition, and capacity-building activities during early project stages. According to the interviewees, the first few years of the project consisted of setting up agreements, building relationships with national, regional, and local stakeholders, and creating the foundations for handing over the school feeding activities to the Government of Rwanda. Two sub-grantees collaborated with the WFP in the implementation of program activities-- World Vision (WV) and Gardens for Health International (GHI). WV conducted literacy and WASH implementation activities while GHI performed nutrition education activities for project participants. According to one interviewee, "the focus of this phase was to make sure that MGD partners were not only looking at MGD but looking much broader and looking at where they could influence policy and strategies and give input based on their experience" (SEI with WFP-Rwanda Staff, June 2021).

WFP-Rwanda was granted a second five-year (FY2020 to FY2025) MGD award ($25M) in 2020. This second phase seeks to develop model schools for the Government of Rwanda to embed lessons from these into its own school feeding programming efforts. "The focus of the Phase 1 programme, designed in 2015, has shifted from a handover of the programme to building the capacity of Phase 1 schools to serve as model schools for the national programme, and then to transition those schools into the national school feeding programme in 2023/24" (RW. MGD.Endline.2016-2021, p. 10). This new phase will continue supporting the Government of Rwanda in two strategic areas [1] "Provision of direct support and creation of 'model schools' for the NSFP[1] ; and [2] Support to the sustainable NSFP, including the transition of the model schools into it" (WFP Plan of Operations and Activities). The first working area includes the following activities: [1] Provide Nutritious School Meals; [2] Promote Improved Health; [3] Promote Improved Nutrition and Dietary Practices; and [4] Support Improved Literacy. Activities under the second working area include building National School Feeding Program Management Capacity (activity 5); and building farmer groups capacity to supply food to schools (activity 6). Regarding Phase 2 of MGD implementation in Rwanda, one interviewee stated:

In the next phase, WFP is trying to build "Model Schools". To make sure that the home-grown school feeding MGD supported schools look like an example because of how they excel in terms of provision of meals, student performance and efficiency-like cutting costs in general. Making sure

1 National School Feeding Program

that every province has a Model School of which other districts and schools can learn from. This would be a legacy for MGD but also have lessons learned from previous practice. (SSI with WFP-Rwanda Staff, June 2021)

Another participant noted:

The goal for this phase is to make sure that the different governance structures are in place, that the policies are understood and rolled out through the operational guidelines that have been developed, and to step forward and lead this national initiative of capacity strengthening. (SSI with WFP-Rwanda Staff, June 2021)

Activities from these two stages are expected to contribute to government-led school feeding sustainability. Capacity building and strengthening of "school models" are expected to lay the foundation for a Rwandan-managed school feeding program.

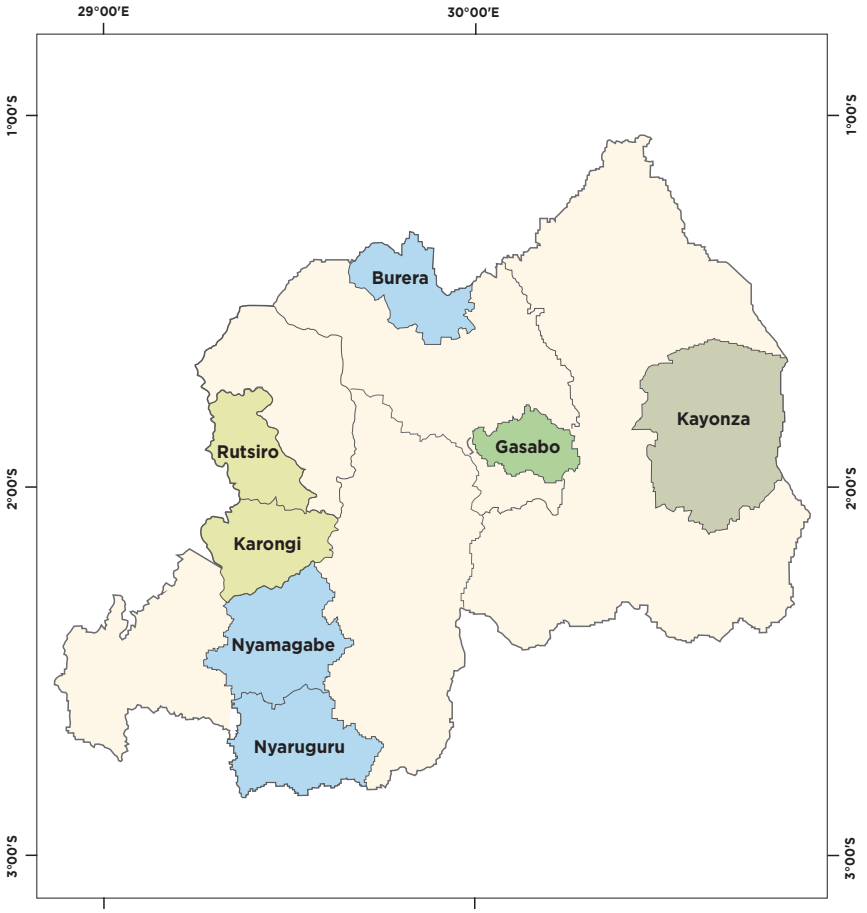
Programmatic Components and Outcomes

This section highlights important project component outcomes. MGD implementation in Rwanda includes activities under the following components: education and literacy, nutrition and health, and WASH. Capacity-building efforts are cross-cutting.

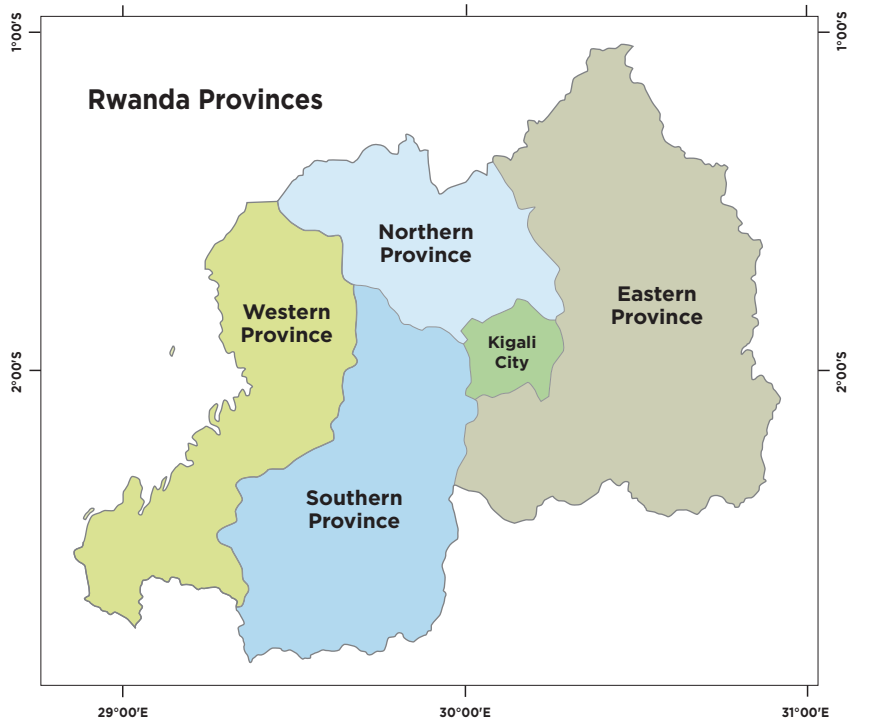
Education and Literacy

Under MGD Results Framework No. 1, the high-level expected result is to "Improve Literacy of School-Aged Children" (MGD SO1). Intermediate results include improved quality of literacy instruction, improved attentiveness, and improved student attendance. In addition to school meal provision as means to improve literacy, the WFP has implemented activities like promoting teacher attendance and recognition, distributing school supplies and materials, establishing libraries, producing books and supplementary reading materials, and conducting teacher and administrator training. Table A (available in the appendix 1.1) shows performance indicator results for education and literacy activities. Data for FY16-1st half is not reported here since implementation was at the

Figure 1.8. MGD implementation sites in Rwanda



Source: Authors based on WFP-MGD documents and OCHA: shapefiles for Rwanda - Subnational Administrative Boundaries (2017)



Source: Authors based on WFP-MGD documents and OCHA: shapefiles for Rwanda - Subnational Administrative Boundaries (2017)

early stages. According to the information available in Table A (available in the appendix1.1), during Phase 1 of implementation, the number of students enrolled in MGD-funded schools peaked in FY17-1st half with 94,572 students with the lowest enrollment reported in FY20-1st half. FY20-2nd half does not have data due to Covid-19-related school closures. Further, the average continuous student attendance recorded in FY19-2nd half was upwards of 77,000, which is an overall decrease from its highest average (89,887) in FY17-1st half.

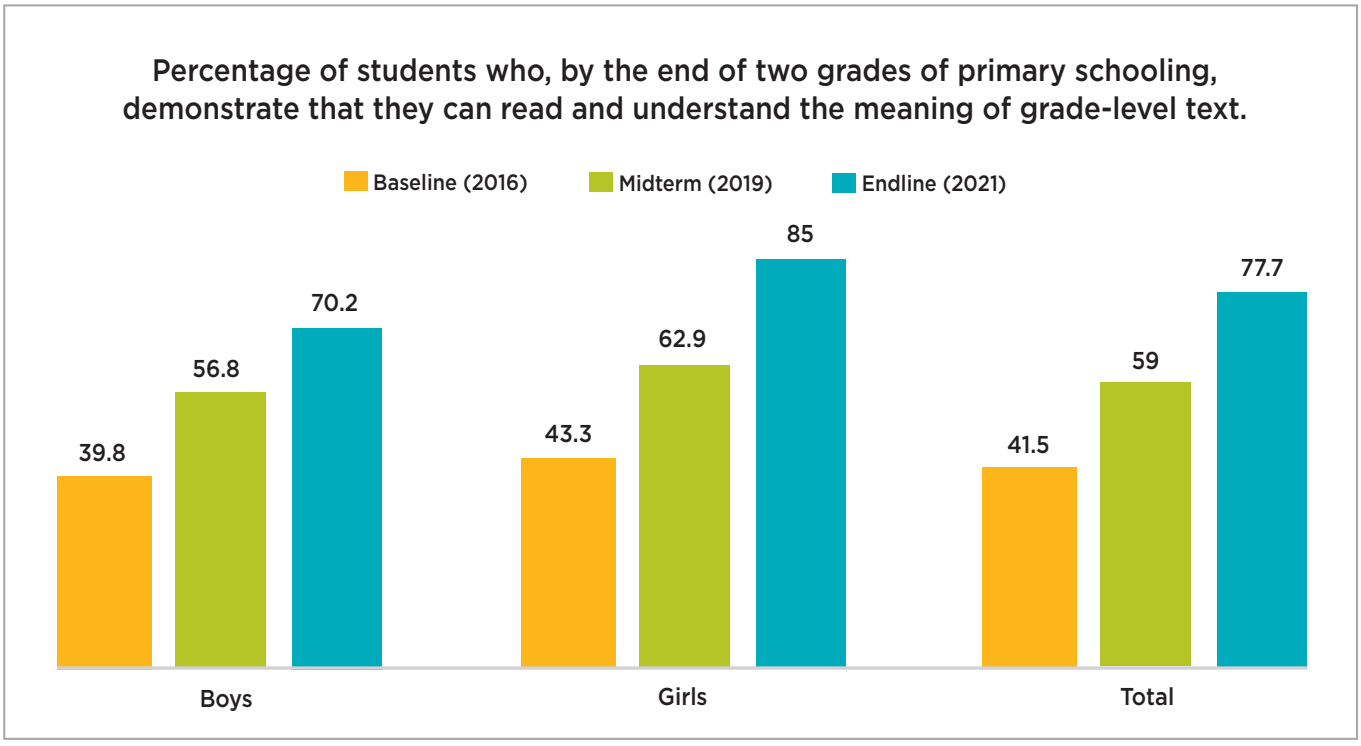
According to Phase 1's final evaluation results, participants' scores on literacy measures improved. Results are displayed under MGD 1 indicator "percentage of students who, by the end of two grades of primary schooling, demonstrate that they can read and understand the meaning of grade-level text," which shows a positive change of 36.2 percentage points (41.5% --baseline to 77.7%--endline). Girls' literacy outcomes (43.3% –baseline to 85%--endline) were better than their male counterparts (39.8% --baseline to 70.2%--endline). According to qualitative interviews included in the final evaluation report, the difference in performance could be explained by higher female participation in program activities like reading clubs which report higher female student attendance. In one district, teachers explained that "boys spend more time playing games" (WFP-Final Evaluation, 2021, p. 22).

Interviews conducted for this study indicate that program implementation targeted beneficiary schools in communities with higher levels of food insecurity and poverty. Improvements in enrollment, attendance, and literacy in participating schools located in these vulnerable areas emphasize the importance of comprehensive school feeding efforts. An interviewee from the school feeding partner organization noted:

The other key achievement is that this project is that it is implemented in an area of our country with poor families and the one of the achievements is the improvement of enrollment of children. The project is implemented in food-insecure areas, so I believe that with the project intervention many children who have left school for different reasons, like to go to work with their families and look for food are now in school and are provided with food. (SSI with key informant, June 2021).

Sustained school meal provision has been fundamental to increasing enrollment and attendance as food is an incentive to attend school. Other contributing factors include awareness-raising activities meant to emphasize

Figure 1.9 Results for the MGD Standard Indicator #1 as reported by WFP-Rwanda



Source: RW.MGD.Endline.2016-2021
Results obtained from EGRA assessments performed at the baseline, midterm and endline of the program implementation

the importance of school among parents and caregivers, teacher training with techniques that better facilitate student learning, and transitioning from teaching in the local language to teaching in English. The staff noted:

In literacy for example, one of the things that we did in the first phase, was an activity where we were training teachers and school administrators on transitioning from using Kinyarwanda as a language of instruction to using English and we were doing this for senior primary schools. During this time those in senior primary schools (P4 to P6) would begin to learn in English. As we are starting Phase 2, something that the government did about a year ago was to provide a directive that the language of instruction (even in lower primary schools) would be English. (SSI with key informant, June 2021).

School Meals

The core component of the MGD program is school meal provision utilizing U.S. government-donated in-kind commodities. Under the MGD results framework, "increased access to food (School Feeding)" (MGD 1.2.1.1, 1.3.1.1) is an expected outcome believed to lead to "reduced short-term hunger" (MGD 1.2.1). Through MGD projects, WFP has provided more than 60 MT daily school meals to about 84,000 school-aged children during Phase 1 of implementation (Table 5). During Project Phase 1, USDA provided Corn Soy Blend Plus (CSB+) and vegetable oil for project participants. In the Western province (Karongi and Rutsiro districts), 3,103.53 NMT of CSB+ was distributed to schools to prepare a daily school meal consisting of CSB+ and sugar, while 626.60 NMT of vegetable oil was distributed to schools in the Southern provinces (Nyaruguru and Nyamagabe districts) to prepare a daily school meal of beans, salt, fortified maize meal, and fortified oil; funds from the Mastercard foundation covered the local purchase of beans, salt, and fortified maize meal. (SEI with WFP staff; WFP Final Evaluation) During Phase 2, USDA has provided 3,790 MT of fortified rice, 620 MT of vegetable oil, and under the LRP project component, 2,064 MT of maize meal and 20 MT of beans. (USDA, Food Assistance Fact Sheet, Rwanda)

The sources for school meals during Phase 2 include in-kind, imported commodities provided by USDA, LRP, and complementary funding from other donors. In addition to the initial four districts, the new phase includes three more districts that cover other high poverty, high food-insecure areas. The new areas allow WFP to have "model schools" in each province. Taking into consideration the importance of planning a successful program transmission at the end of Phase 2, the "number of WFP-managed school meals per year will be scaled back

Table 1.8 Rwanda-MGD: Provision of school meals during phase I of the program

IMPLEMENTATION PERIOD	MGD Ind. Number of school-aged children receiving daily school meals (breakfast, snack, lunch) as a result of USDA assistance	MGD Ind. Number of daily school meals (breakfast, snack, lunch) provided to school-age children as a result of USDA assistance
FY 16- 2nd Half	82,360	2,824,482
FY 17- 1st Half	94,572	9,143,934
FY 17- 2nd Half	84,876	8,487,600
FY 18- 1st Half	84,992	6,526,756
FY 18- 2nd Half	83,590	7,539,818
FY 19- 1st Half	81,250	6,987,500
FY 19- 2nd Half	81,250	7,695,855
FY 20- 1st Half	78,410	5,880,750
FY 20- 2nd Half	0	0
FY 21- 1st Half	79,624	4,906,782
FY 21- 2nd Half	79,624	5,662,071

Source: Authors from biannual performance indicator reports provided by USDA-FAS
The "0" number on FY20- 2nd Half reflects school closures in Rwanda due to Covid-19

in years 4 and 5, to 28,698 learners, until full transition to Government of Rwanda support at the end of the program." (WFP Plan of Operations and Activities, p. 2)

Nutrition, Health, and Dietary Practices

Along with the goals for increased food access and reduced short-term hunger, MGD utilizes a second Results Framework with an ultimate goal to "increase use of health nutrition and dietary practices." (MGD SO2) Each project's nutrition aspects include activities like deworming and health and nutrition training for participants. The nutrition and health component is a combined effort between GHI and the WFP. GHI works towards the improvement of participant nutrition status by implementing activities like nutrition education, shopping for nutritious foods, cooking demonstrations, and improvement of agricultural capacity through school gardens. In 2019, GHI started distributing seedlings to students and parents. GHI helped establish school gardens in 104 participant schools. The WFP performed many nutrition-related activities in schools that led to the improvement of food preparation and storage equipment (e.g., kitchens, cooking areas, storerooms, stoves, and kitchen utensils), contributed to the improvement of cooking infrastructure, and trained cooks and food keepers on proper food preparation and storage practices. These efforts at the school-level contributed to the development of national school feeding guidelines—adopted by the Government of Rwanda in 2021.

In addition, projects include WASH activities. According to one interviewee for this study, when the project began collaborating with participant schools, implementers noticed that there were issues with water availability at participating schools. When water is not available, implementers must identify a nearby water source. From there, implementers collaborated with the district level partners to construct pipelines from the identified water source to the participant school. The interviewee states:

> *When we identify a school that does not have water, we look for a water source near a school. We work with district partners to construct a pipeline and then turn it over to a water purification organization. Because we use gravity fed water sources, you have to make sure the water is tested all the time and protected. After implementation is over, it is hard to keep up with the private water companies to make sure this is happening. We also try to make sure that the communities take responsibility here. (SSI with key informant, June 2021)*

According to Phase 1's endline evaluation, 104 participating schools were using an improved water source. One interviewee reported that 20 schools had access to running water because of project efforts. During water shortages, the WFP and WV collaborate to install water tanks for school water storage.

All schools participating in Phase 1 have established Food, Health, and Hygiene Clubs. These provide students with opportunities to learn about health and hygiene practices. Another project accomplishment is the construction of menstrual hygiene management rooms for girls in schools, which is believed to have increased female attendance in schools. According to one interviewee this initiative contributed to reduce student absenteeism among female students:

> *During the final evaluation, the companies that evaluated the project indicated that student absentees due to illnesses has decreased from 8.00% in 2016 to 1.72% at the end of the project among female students, and from 7.00% in 2016 to 2.30% at the end of the project among boys. (SSI with key informant, June 2021)*

Partnerships for School Feeding in Rwanda: The role of MGD

Partnerships with the Public Sector

This section documents the partnerships started by the WFP as a result of its MGD-related work in Rwanda with special emphasis on public sector partnerships with the Rwandan government. Under the public sector category of partnerships, this study reflects on the WFP's collaborative efforts with Rwanda's central government through its multiple ministries, entities of the decentralized sector, and local level entities (i.e. district level). Table 1.9 summarizes the school-feeding partnerships between the WFP and public entities in Rwanda.

The partners listed in the table reflect WFP's efforts,

Table 1.9 Summary of public partnerships for school feeding under MGD Rwanda

PARTNER	CONTRIBUTIONS TO SCHOOL FEEDING
Ministry of Education (MINEDUC)	MINEDUC is the lead entity for coordination, management, implementation, and monitoring of the school feeding program. MIEDUC and the WFP-MGD are key partners to implement efforts towards the strengthening of a sustainable national school feed work.
Ministry of Agriculture (MINAGRI)	MINAGRI is responsible to develop the framework and guidelines for the functioning of the value chain for local farmer. This is a critical aspect for local procurement for school feeding of the HGSF model.
Ministry of Infrastructure (MINIFRA)	Collaborate with implementing partners (WFP and WV) in the development of water infrastructure in schools.
Water and Sanitation Corporation (WASAC)	Collaborate with implementing partners (WFP and WV) in the development of water infrastructure in schools.
Ministry of Health (MOH)	MOH provides guidelines for maternal and child health interventions that provide the framework for GHI nutrition action.
Rwanda Biomedical Center (RBC)	RBC is "the nation's central health implementation agency." Under the MGD implementation, it supports complementary health and nutrition interventions.
National Early Childhood Development Programme (NECDP)	NECDP provides guidelines for maternal and child health interventions that provide the framework for GHI nutrition action.
Rwanda Educational Board (REB)	World Vision and REB will collaborate to support the professional development of teachers through ongoing school-based professional development.
Ministry of Finance and Economic Planning (MINECOFIN)	Collaborate with MINEDUC and other national level entities in the identification of budget sources to support the national school feeding program. MINECOFIN ensures allocation of resources and facilitates mobilization of resources from the private sector and international donors.
Ministry of Local Government (MINALOC)	According to the NCSFP, MINALOC will provide oversight on the integration of the School Feeding Policy at the different levels of governance. For this, the WFP and MINALOC will collaborate to support districts in reflecting the NSF Policy and Strategy in their development and education plans.
Ministry of Trade and Industry (MINICOM)	According to the NCSFP, MINALOC will create an appropriate framework that will link the supply chain of farmer cooperatives produce to the school feeding program.
Rwanda Cooperative Agency (RCA)	In collaboration with the WFP, MINAGRI and MINICOM, the RCA will develop and implement strategies to improve financial inclusion of smallholder farmers (SHFs).
District Education Offices	Key local partners for implementation of MGD School feeding programming.

Source: Partnerships Assessment Tool developed by authors from primary and secondary sources.

in the context of MGD projects, to develop a strong collaboration with Rwandan government entities to create the conditions for the transitioning of school feeding efforts. Being a UN agency, the WFP has prior established recognition and credibility that allowed it to become a key player both inside and outside the realm of comprehensive school feeding program implementation. UN funds also allowed them to become a key player in school feeding policy design. Its presence in Rwanda and strong connections with that government, as well as the inclusion of specific activities to develop governmental capacity for school feeding, resulted in its recognition by the Government of Rwanda as a key partner in school feeding. Many of these efforts are the result of their long-term presence in the country and access to MGD funds. In addition, the WFP in Rwanda has been able to access resources from the WFP Brazil Center of Excellence (CoE). Collaboration with the WFP Brazil CoE has informed some of the WFP's MGD work in Rwanda. The Center's primary focus is to link school feeding initiatives to local agriculture systems, for which they provide technical assistance to governments in the design and deployment of HGSF programs. Rwanda's government has benefited from technical and financial assistance from both the WFP Rwanda country office and the CoE, as well as funds for the implementation of comprehensive MGD program projects. Table 1.9A summarizes the key partnerships for school feeding

Table 1.9A Summary of public partnerships with inter-governmental organizations for school feeding under MGD Rwanda

PARTNER	CONTRIBUTIONS TO SCHOOL FEEDING
UNICEF	Collaborate with the WFP and Ministry of Education in the development and review of sectoral policies (Nutrition, Nutrition-Sensitive Agriculture, education, WASH) to ensure consistency with the National School Feeding Program.
World Health Organization (WHO)	Provide deworming tablets to assist MGD programmatic efforts.
African Union and WFP Center of Excellence against hunger	Partnership for the promotion of the Home-Grown School Feeding model.
USAID	• Provide a framework for action on the MGD Education and Literacy component. • To ensure complementarity of US Government funding in Rwanda, the MGD literacy activities were designed to complement national literacy interventions implemented by USAID and aligned with the Country Development Cooperation Strategy 2020-2025 development objectives "improved learning outcomes" and intermediate results: (1) improved inclusive and quality early grade literacy classroom instructions, (2) strengthened education system management, (3) strengthened community support for learning. • Proposed literacy interventions will complement USAID's new LEARN project 2020-2025 which is expected to build off of current national initiatives and provide continued support to the GoR to improve literacy outcomes of primary students up to grade 3, to improve school-based instruction and systems and to strengthen community structures to improve literacy learning.
International Institute of Tropical Agriculture (IITA)	Collaboration with GHI in the provision of seedlings for school gardens.
WFP	In addition to its role as implementing partner of the MGD program in Rwanda, the presence of the WFP in country with a broader scope of work as outlined in the Rwanda Country Strategic Plan 2019-2023 in support of the efforts to ensure national nutrition and food security priorities.

Source: Partnerships Assessment Tool developed by authors from primary and secondary sources.

in Rwanda with international intergovernmental organizations mobilized by the WFP-Rwanda. To date, the Government of Rwanda has shown commitment toward school feeding through the adoption of the National Comprehensive School Feeding Policy and the recent release, supported by the WFP country office in Rwanda, of national school feeding guidelines. Interviews for this study suggest that WFP implementation staff take deliberate action to maximize their collaborative efforts with the Government of Rwanda:

WFP is still very much learning about this space and how it is specific to each country. WFP is talking and, in many places, making this shift from being an implementer to an enabler, so working much more closely with governments, providing technical assistance, not just providing food and so forth. That will be the transition completely in the years to come it seems. (SSI with key informant, June 2021)

WFP-Rwanda has instituted important endeavors to improve food security and school feeding in the country. WFP-Rwanda, supported by the US Government/ USDA-FAS MGD funds and leveraging its HGSF framework (FAO & WFP, 2018), has strengthened the Government of Rwanda's commitment to and support of a national school feeding program. To date, the Rwandan national school feeding program feeds children in pre-primary, primary, and secondary schools with government (around 40%) and parent contributions (about 60%) (Interview with key informants, June 2021). According to the Rwanda School Feeding Operational Guidelines, the cost of the base meal per child is 150 RWF; the government provides 56 RWF of the 150 RWF with the remaining is provided by parent contributions. A line item in the Ministry of Education's budget will be allocated to fund the NCSFP's core components; funding for complementary interventions will be added to the budget of the other government entities involved. The policy recognizes the importance of additional funding sources which include development partners like donor governments, UN Agencies (e.g., WFP, FAO, UNICEF), other governmental and non-governmental agencies, and the private sector and local communities.

As previously detailed in this report's policy section, the NCSFP identified important government entities and established their corresponding responsibilities in the deployment of the national school feeding program. These partners have been identified by the WFP as partners in the development of MGD school feeding-related initiatives that are expected to become the model for the national school feeding program. The relationship between the WFP and the Government of Rwanda, particularly with the Ministry of Education, is evidence of a strong collaboration between the two entities. The collaboration began by establishing a memorandum of understanding between the WFP and the Rwandan government and formalizing their partnership. Under MGD project Phase 2, efforts toward strengthening this partnership will mainly focus on capacity development for the deployment and expansion of the national school feeding program.

Phase 1 of MGD enabled a project-based steering committee for school feeding that will, in Phase 2, transition into the National School Feeding Steering Committee (NSFSC) and include government representatives and development partners (i.e., the WFP and WV). A Technical Working Group (TWG) led by the WFP will provide technical support to the decision process at the NSFSC. Under Phase 2's collaborative efforts, model schools will become learning opportunities that will inform national school feeding program efforts. To track partnerships with the public sector, the WFP has included a new set of custom indicators in its performance management plan (PMP). These indicators will keep track of the activities related to capacity building among necessary governmental partners. These indicators include:

- Percent increase in the budget allocated by the Government of Rwanda to Home-Grown School Feeding Program
- Number of government staff trained at the national level
- Number of government staff trained at the district level
- Number of HGSF Steering Committee and Technical Committee meetings held
- Number of government financing strategies developed
- Number of government monitoring and evaluation systems established
- Number of district and national-level Ministry of Education and Ministry of Agriculture staff supported by new HGSF policies
- Number of government staff trained or certified as a result of USDA assistance (female)

Analysis shows that two main risks to national school feeding program sustainability, once it's handed over completely to the government, are budgetary constraints and a lack of full government commitment. Although the

NCSFP gives the budgetary responsibility to the Ministry of Finance and Economic Planning to identify funds for the program and establish a budget line item under the Ministry of Education's budget, there are still limited funds dedicated to school feeding in Rwanda. One clear example of this is that the government will only cover around 40% of the school meals in their national school feeding program; remaining meal costs should be covered by parent contributions. This may be problematic, especially in areas with persistent poverty and food insecurity. According to one participant in this study when discussing the 40/60 shared cost of school meals:

It is really a challenge because of course there are some areas where parents can manage, but there are many other areas where it's impossible for parents to contribute. And it's even driving significant dropout for a lot of students. This is because that budget is so limited, and schools are all doing different things." (SSI with key informant, June 2021)

Earlier in 2011, under another school feeding intervention led by the WFP, a 2+3 pilot of providing food only three days per week while the community was responsible for providing meals for the remaining two school days resulted in negative impacts on attendance and retention (see NCSFP). One of the interviewees stated in some government schools, they can only feed students whose parents contribute support for school meal provision, something that should not happen within a school feeding program. It is expected that the capacity-building effort led by the WFP under MGD project Phase 2 will provide an opportunity to explore funding alternatives that do not increasingly burden already food insecure households.

"Partnerships with the private sector are important for school feeding programming because they can stimulate innovation in problem-solving, provide opportunities to access capital, and produce economic growth."

Private Sector Partnerships

Partnerships with the private sector are important for school feeding programming because they can stimulate innovation in problem-solving, provide opportunities to access capital, and produce economic growth. Under the HGSF framework, linking the agricultural sector with school feeding programs creates opportunities for economic development and school feeding sustainability within the broader food system. One of the interviewees suggests that notions about the private sector tend to only consider larger enterprises; however, school feeding in Africa also presents opportunities for medium and small enterprises to engage at different points in the supply value chain for school meal provision. Therefore, opportunities for the expansion of partnerships with the private sector exist within the commodity value chain. The case of Rwanda, particularly under the implementation of the LRP component (see Section 2 of this report), provides evidence of the potential impact of local capacity building when implementing actions toward the strengthening of smallholder farmer enterprises.

The objective of the LRP project component in Rwanda was to improve the effectiveness of food assistance and the expected outcomes including increased value of sales by project beneficiaries. The final evaluation of the LRP project component indicates that 5,617 benefited from the program, which represents about 10% of farmers in the project implementation area. The project component has significantly contributed to private sector partnerships through the connection it created between smallholder farmer cooperatives and buyers from the Farm to Market Alliance (FTMA) in Rwanda. As a result, there were increases in output and sales, and enhancement of port-harvest practices. The Rwandan government documented the experience to show that collaboration with the private sector can greatly improve SHF output and capacity to perform in the value chain, driven by the market that school feeding can provide. Regarding the role of the alliance in Rwanda, RWARRI posted on their social media:

The Alliance promotes the establishment of the sustainable pro-smallholder agricultural value chain intending to increase smallholder income and foster commercial viability for private sector actors engaged in the Alliance. RWARRI and RDO are currently assisting 207 cooperatives regrouping 72,039 smallholder farmers, in which 35,570 are females. The farmers' organizations are growing maize or beans in season A, B, and C. Six big formal buyers in Rwanda, such as MINIMEX, SARURA, EAX, AIF, RGCC, and Gorilla Feeds, are signing pre-harvest contracts with cooperatives at the beginning of the season. (RWARRI, 2020)

Table 1.10 Summary of partnerships with the private sector for school feeding under MGD Rwanda

PARTNER	CONTRIBUTIONS TO SCHOOL FEEDING
Farm to Market Alliance (FTMA) Rwanda Rural Rehabilitation Initiative (RWARRI) and Rwanda Development Organization (RDO)	FTMA is a collaborative effort of six agri-focused organizations: The Alliance for Green Revolution in Africa (AGRA), Bayer, Rabobank, Syngenta, the WFP, and Yara International that develops products and services tailored to the needs of farmers in conjunction with local private sector of participating countries including Rwanda. The WFP leveraged its participation in FTMA to engage farmers from the LRP program in this effort. FTMA is implemented in RWARRI and RDO in 18 districts.
Farmer Organizations	Participate in capacity building exercises led by the WFP to improve their ability to produce commodities to supply schools for meal provision.
Commodity Traders	Commodity traders aggregate food commodities and supply to School Feeding Program for a profit.
Africa Improved Foods (AIF)	AIF is a Public-Private-Partnership (PPP) formed by DSM, FMO, DFID, IFC, CDC, and the Government of Rwanda. AIF leads the fortification sector in Rwanda (90% of the share). AIF produces fortified blended flours, that are later sold to the WFP to supply their mela provision programs including school feeding programs.
MINIMEX	For the school meals program, the WFP procures maize meal from MINIMEX. MINIMEX Ltd. "is the largest producer of fine maize products in Rwanda. "It is committed to play a central role as buyer of maize from Rwandan farmers, cooperatives and traders and as provider of healthy nutritional products to the population and institutions... [they] has gained a central position in the food value chain in Rwanda as one of the larger buyers of local maize and as largest provider of quality maize flour in the country." (MINIMEX, n.d.)
Rockefeller Foundation Vanguard Economics	Rockefeller foundation provided funds to carry out a pilot to test the usage of a nutritient-rich whole grain fortified flour among school aged children to reduce the usage of highly refined flour in school meals. The pilot is implemented by a local organization called Vanguard Economics.

Source: Partnerships Assessment Tool developed by authors from MGD documentation and interviews with key informants.

Participants in this PPP include:
-Royal DSM, a Dutch multinational corporation active in the fields of health, nutrition and materials;
-FMO, a Dutch development bank;
-DFID, the British Department for International Development which was responsible for administering foreign aid;
-IFC, the International Finance Corporation is an international financial institution that offers investment, advisory, and asset-management services to encourage private-sector development in less developed countries and a member of the World Bank Group;
-CDC, which is UK's development finance institution;
-The Government of Rwanda. (Mugabekazi, 2021)
*This is a footnote that belongs to one of the parnters in the table: Africa Improved Foods.

Another important area of work with the private sector is fortification. The Government of Rwanda has mandated fortification of maize flour, salt, and wheat flour since 2019 (Global Fortification Data Exchange, n.d.). Fortification is concentrated in a few agro-processors centralized in Kigali, including AIF, MINIMEX, and SOSOMA Industries Ltd. AIF holds a 90% market share of the fortification industry in Rwanda; they supply WFP with fortified blended flours to use in their programs (WFP, 2021). MINIMEX (another source of procurement for the WFP) is the largest producer of fine maize products in Rwanda and the only producer of fortified maize flour (WFP, 2021). It plays a key role in the agricultural value chain in Rwanda, purchasing maize from farmers, cooperatives, and traders. The connections created by the WFP through the LRP, and broadly speaking the HGSF in Rwanda, have contributed to a shortening of the supply chain while improving farmer capacity to deliver the expected produce agro-processors need. These collaborations are important to the continued improvement of quality inputs for school feeding.

According to staff from the WFP working in the value chain, the LRP and FTAM efforts sought to shorten the supply chain which subsequently improved farmers' capacity to meet buyers and agro-processors' needs (i.e. higher quantities and meeting quality standards). This also created a win-win situation for participant farmers who then increased their income share by reducing the number of intermediators. One example demonstrating the importance of quality assurance in post-harvest capacity development is seen in issues surrounding maize quality: "Due to the lack of quality maize produce grown in Rwanda, AIF initially imported more than 80 percent (80%) of its annual maize requirements from Tanzania, Zambia, and Uganda because the local maize had unacceptable level of aflatoxins" (Mugabekazi, 2021). The LRP, and broadly the HGSF, have worked to enhance post-harvest farmer capacity. The value chain model implemented by the WFP consists of an assortment of buyers and agro-processors and smallholder farmers associated in farmer cooperatives that are later connected through initiative business forums to gain access to markets, provide the complementary services to farmers around access to inputs, post-harvest technology, and finance.

Another instance of a private section partnership that benefits school feeding in Rwanda is the pilot for nutrition-rich wholegrain fortified flour. Under the WFP HGSF framework, the Rockefeller Foundation provided funds to carry out a pilot to test the usage of a nutrition-rich wholegrain fortified flour among school-aged children to reduce the usage of highly refined flour in school meals. The pilot was implemented by a local organization called Vanguard Economics. "Nutrition-rich wholegrain maize flour is replacing refined maize flour in school meals for 15,000 school children in the Southern Province of Rwanda under a 1-year pilot project. The pilot aimed to increase nutrition in primary school meal programs while educating children, their families, and the wider school communities about the nutritional benefits of consuming fortified wholegrain flours" (Rasmussen, 2021). The pilot took place in schools supported by the WFP and USDA-MGD. According to interviewees for this study, the goal of the pilot was to explore how the local private sector could play the role of maximizing school feeding as a platform for nutrition, optimizing supply and demand, and finding nutritious alternatives with local commodities.

There are multiple opportunities for private sector engagement in school feeding programming, from locally sourced commodities to exploring collaboration for research and development. However, addressing key areas for improvement is needed for continued increases in private sector engagement for school feeding. There is an increasing need to expand on research opportunities that would allow implementers to have and utilize evidence-based practices. One participant in this study stated,

Things like research, evaluation and building the evidence base are important to support private partnerships. To some extent they (referring to private partners) have analytical capacity in-house, they have an assessment and research team but there is a lot of work done with external providers. Building the external capacity when it comes to research related to school feeding and school-based programs is important. (SSI with key informant, June 2021)

Another interviewee added that there is a need to expand research and collaboration opportunities to add animal protein to school meals and to lower commodity costs.

There is also a need to increase awareness about the importance of school feeding among private sector partners including showing the potential returns on investment in

Table 1.11 Summary of community-level partnerships for school feeding under MGD Rwanda

PARTNER	CONTRIBUTIONS TO SCHOOL FEEDING
Local Communities & World Vision	The World Vision used its Citizen Voice and Action (CVA) model to train members of the community on ways to engage citizens in process of accountability on water issues, and other problems that may affect the community at large.
Local Communities & GHI	GHI implements Training of Trainers (ToT) modules for school gardens and nutrition education as a strategy to contribute to the sustainability of school.
PTAs	To help PCI perform teacher training, implement elements of school feeding, and aid in developing national school feeding guidelines. The starting No. of PTAs: 104 (one per school after phase I of MGD)
Nutrition Oversight Committees (NOC)	To provide oversight of nutrition and agriculture trainings in WFP-MGD supported schools. This will contribute to ensure sustainability. NOCs are by SGAC members trained on the CVA model, head teachers, teachers, local leaders (village and cell), cooks and school owners.
WASH Committees	"World Vision will facilitate the establishment of WASH committees and reinforce Water User Committees, made up of teachers and community members (men, women, youth) to promote good health and hygiene practices in schools and communities surrounding the schools." (WFP Plan of Operations and Activities)
School General Assembly Committee (SGAC)	SGACs were created by the Rwandan Law (Law 23/2012) as an organizational structure for school management. They consist of parents, head teacher, teachers, school administrative staff, 2 student representatives and the school owner or the representative for the government subsidized schools (Aziza, Williams & Akaliza, 2016).

Source: Partnerships Assessment Tool developed by authors from MGD documentation and interviews with key informants.

school-aged children's nutrition. This is an area where the WFP, in collaboration with the public sector entities, can develop methods to continue communicating the benefits of school feeding for the overall well-being of the nation.

Community-Level Partnerships

The HGSF framework emphasizes the need to involve communities in the school feeding process. In the case of Rwanda, communities get involved in MGD project implementation as beneficiaries and suppliers of food and labor. Communities benefited from the MGD school feeding program not only from the meals children receive and the potential ripple effects that this may have in long-term community development but also by engaging parents as cooks and storekeepers (mostly to receive meals in exchange for program participation) and participating in activities that lead to community empowerment to oversee other programmatic efforts carried out in the local areas. WV and GHI have led initiatives that are expected to greatly contribute to the sustainability of school feeding.

WV is responsible for implementing WASH components within Rwanda's MGD projects. One of their tasks is to identify water sources for schools both for meal preparation and sanitation. At the village and cell levels, staff from the WV work with the district partners to address issues of school water availability. Once that step is completed, it is up to the communities to ensure that private companies continue adequate service provision. In order to help communities acquire the necessary skills for determining water quality and availability, the WV implements the Citizens Voice and Action (CVA) model among community members:

> *CVA is an evidence-based, social accountability model that operationalises and strengthens relationships of direct accountability among citizens, policymakers and service providers. It tackles the root causes of poverty, vulnerability, marginalization, exclusion, inequality, and poor governance. (World Vision, 2020, p. 2)*

The implementation of the CVA model is expected to contribute to the sustainability of school feeding

programming by empowering communities with knowledge and skills they can later put into play to advocate for prioritizing schools, especially during instances of water rationing. WV uses the CVA model through a Trainer of Trainers approach (ToT); this allows them to work closely with local leaders who can later ensure the diffusion of information throughout the community. WV uses ToT as a crosscutting tool to work with communities not only to develop accountability skills, but also to help with the dissemination of information under health promotion campaigns, soap making, and overall community participation in WASH related activities.

GHI also works closely with communities under the nutrition education component through school gardens by providing seedlings to parents and students. At the end of Phase 1, 104 schools had gardens. The gardens are a GHI-community collaborative effort. Using the ToT approach, GHI supported SGAC members to train parents and other community members in nutrition education and gardening techniques. Aiming at empowering community leaders to become nutrition champions, GHI leads annual nutrition and gardening refresher training for cell leaders and three SGAC members from MGD schools. GHI conducts an annual home garden survey to gather up-to-date information about the status of crops and harvest (RW.MGD. Endline.2016-2021).

For GHI, school feeding programming accountability is critical for project success and sustainability. Under MGD, and as a joint effort between the community and GHI, imihigos[2] were developed to track school feeding performance:

> *These contracts provide an outline of all nutrition and gardening activities to be implemented by GHI in addition to roles and responsibilities of both GHI and the schools. Schools were continuously encouraged to follow the performance contracts and ensure that activities were implemented according to plan. (WFP Plan of Operations and Activities, p. 7-8)*

Another important area of community engagement for school feeding is parent contributions for the provision of school meals. As explained earlier, the school feeding guidelines established that the national school feeding program would rely on parent contributions for meal provision (60% provided by parents and 40% by government subsidies). Despite the main improvements that this model can produce, it is associated with some overwhelming challenges according to implementation staff; these challenges include household poverty, the assumption that school feeding is the government's sole responsibility, and decreased household income because of COVID-19. Having limited parent contributions has led to limited availability of resources to pay cooks and purchase wood and local vegetables (RW.MGD. Endline.2016-2021). The NCSFP believes that school gardens can be leveraged to improve parent contributions to school feeding. However, GHI staff suggest that there is still much work to be done before school gardens can become a reliable source of commodities. Currently, they trying to create a community engagement and nutrition education activity to help remedy these challenges. Further, NCSFP recognizes how challenging it is to utilize school gardens as tool to ensure parent contributions:

"Another important area of community engagement for school feeding is parent contributions for the provision of school meals […] Despite the main improvements that this model can produce, it is associated with some overwhelming challenges according to implementation staff; these challenges include household poverty, the assumption that school feeding is the government's sole responsibility, and decreased household income because of COVID-19"

> *The current status of school garden coverage in 2018 is at 68.5%, from 60.7% in 2014. The projects have however experienced challenges that include the short term nature of the school gardens initiatives without operational exit strategies for sustainability; training of teachers to build their capacity but no linkage with district agronomists to provide technical backstopping; availability of water particularly during the dry season; lack of land; lack of financial resources for the gardening activities, and exposure to external destructions as most of the schools are not fenced. (NCSFP, 2019, p. 13)*

Another area of consideration for community engagement is the role of traditional gender roles in Rwandan communities benefiting from MGD school feeding

2 "To hold public officials accountable, the government chose to adapt the idea of performance contracts to a traditional practice of setting and achieving goals called Imihigo. First implemented with district mayors, Imihigo were later expanded across government ministries and agencies. The increased focus on performance of public officials helped Rwanda achieve impressive rates of economic growth, rapidly improve infrastructure, and increase health and education outcomes for its citizens." (World Bank, 2018, p. 52)

program projects. Children's education is traditionally a woman's role. The push for community contributions, while important, needs to take into consideration that the overall distribution of domestic activities and burdens are mostly carried by women and how the requirement of parent contributions can increase this burden on women. Other gender-related barriers need to be considered when engaging women in school feeding programming. For instance, cultural perceptions about a woman's role, strength, and safety. According to the WFP's final report of Phase 1 of MGD, "73 percent of WFP-assisted schools have at least one female cook. Some barriers remain to women's employment as cooks, including the attitude of many men that women are not strong enough to stir the large pots of food. Another barrier in the western region is the need for cooks to walk to school before sunrise, which is not safe for women, in order to prepare porridge in the morning." (RW.MGD.Endline.2016-2021, p. 34).

Partnerships and the Sustainability Rwanda's School Meals Program

The implementation of the MGD program in Rwanda and the capacity of the WFP to reach multiple sectors and instances across the country has contributed not only to the achievement of important programmatic outcomes (i.e., literacy, meal provision, WASH, farmer capacity) but also to the design and implementation of a policy and regulatory framework for school feeding. Current programmatic efforts have gained not only strong public sector support for school feeding but also have enabled the participation of the private sector. The conjunction of the MGD results framework and availability of funds, along with the WFP capacity to leverage support, are important steps towards the building of a sustainability framework for a government-led school feeding program in Rwanda. There is still room for enhancing collaborations with local communities. Through the participation of collaborators like WV and GHI, there have been important efforts toward the inclusion of communities in the school feeding program. However, there is a need to raise awareness about the role of vulnerable households and demands to engage in the school feeding activity through the provision of resources. While community in-kind contributions are important, high reliability on those resources can create a risk of community disengagement and overburden, especially to vulnerable groups like rural women.

Analysis of School Feeding Partnerships in Sierra Leone

Institutional Framework for School Feeding

Socio-economic and Policy Context

Nutrition and Food Security

Located in West Africa, Sierra Leone has an estimated population of 7.9 million people, of which, half are people under 18 years old (World Bank, 2022b; UNICEF, 2021). It has one of the lowest Human Development Index (HDI) rankings worldwide (0.452 in 2019), ranking 182 out of 189 countries (UNDP, 2021). The recent history of Sierra Leone featured more than a decade of civil conflict (1991-2002) and an Ebola outbreak (2014-2015). These events continue to affect the country's Government and civil society's capacity to implement actions to improve population wellbeing. Population-level poverty is at 59.2% according to the most current measures (UNICEF, 2021). Additionally, a 2017 multidimensional measure of child poverty revealed that child poverty at 66%[1] (UNICEF, 2019), making children a highly vulnerable population. A recent district-level analysis shows that the incidence of child poverty in the Koinadugu district (where MGD implementation takes place[2]) is the highest in Sierra Leone, with 85.4%.

Along with poverty, food insecurity remains a significant problem among Sierra Leoneans. The WFP (2021a) reported that 57% of the population is food insecure, while 12% are severely food insecure. Food insecurity is even more acute among rural populations (3.3 million are food insecure), compared to their urban counterparts (WFP, 2021a). Disaggregating food insecurity analyses by gender illustrates that female headed households are more likely to be more severely food insecure (13%) than male headed households (11%; WFP, 2021b). The rise and spread of COVID-19 worsened the already precarious state of food insecurity in Sierra Leone.

In addition, child malnutrition remains problematic; in 2019, stunting among children under five was at 29.5%, under-five wasting was 5.4%, and infant mortality was at 108 deaths per 1,000 live births (UNICEF, 2021; 2021 Global Nutrition Report). According to the 2021 Global Nutrition Report, the numbers in indicators like minimum acceptable diet (MAD) (9%), minimum meal frequency (MMF) (32%), and minimum dietary diversity (MDD) (25.1%) among infants and young children ages 0 to 23 months, provide some insights about the persistence of food insecurity problems among this age group. Gender disaggregated information suggests that these indicators (MAD, MMF, and MDD) feature slightly better results among girls than boys. Estimates for thinness among children and adolescents (5 to 19

1 A measure of multidimensional poverty was used. According to the study, "a child is defined as poor if they are deprived in one or more of the following dimensions: health, nutrition, water, sanitation, education, shelter or information" (UNICEF, 2019, p, 5).

2 McGovern-Dole implementation in Sierra Leone takes place in the Districts of Koinadugu and Falaba. Falaba District was created in 2016, out of the Koinadugu District. Therefore, district level data for Koinadugu includes information for Falaba.

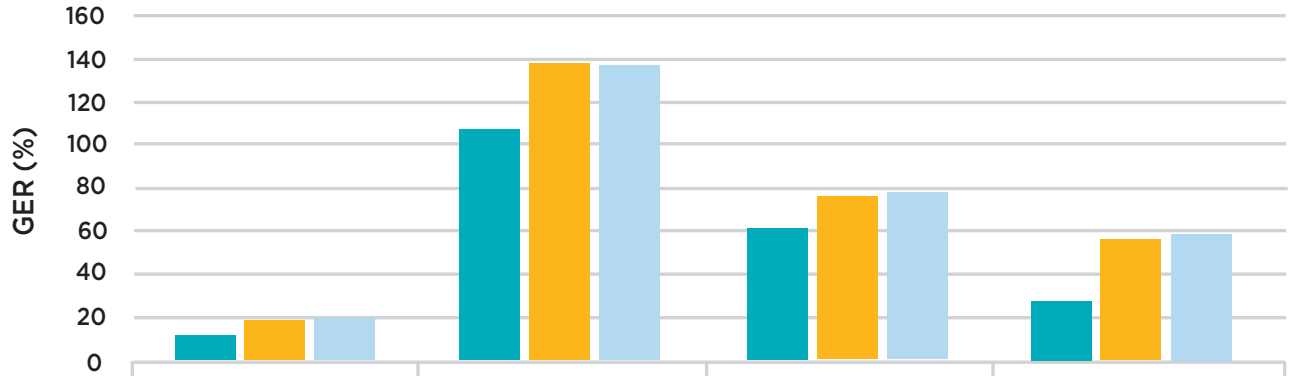
years old) show that boys (9%) are twice as likely to be thin than girls (4.6%). In contrast, nutrition data for adults show a higher prevalence of obesity among women (15.6%), compared to men (4.7%); similarly, the population's percentage of overweight women (38.1%) is almost 1.5 times higher than its population of overweight men (20.5%) (2021 Global Nutrition Report).

The issues of food insecurity and malnutrition are closely related to the many weaknesses of Sierra Leone's agricultural system, a system featured by low productivity and high reliance on food imports. Agriculture is one of the most important economic activities in the country, and about two thirds of the population derive their livelihoods from agriculture as smallholder farmers. It is reported that 60% of Sierra Leone's GDP comes from agriculture yet agricultural production and productivity remain low resulting in a significantly large proportion of food imports and disproportionately high food prices (ITA, 2021). Data from the World Bank (2022a) indicates that for 2018, 32% of total imports correspond to food, and in general there is a high reliance on food imports making Sierra Leone a food deficit country (WFP, 2021a). Government led strategies to improve self-reliance of food production seek to increase rice self-sufficiency through private sector engagement and investments in research and development; crop diversification; livestock development; and improvement of forestry management Ministry of Agriculture, Forestry and Food Security of Sierra Leone, 2022).

Education

In 2018, the Government of Sierra Leone launched the Free Quality School Education (FQSE) program aiming at increase access to quality pre-primary, primary, and secondary school. Over the years, enrollment in education has notably improved. The total Gross Enrollment Ratio (GER) in primary education for 2020 was 141.33% (143.67% for females and 138.98% for males), an increase from 113.78% in 2011 (110.77% for females and 116.81% for males) (UNESCO, 2022). Nevertheless, junior and senior secondary enrollment rates are lower than primary school rates which suggests that fewer students continue seeking education beyond primary school. The 2019 primary school GER saw a 15% increase compared to 2018 (77% for males and 76.7% for females), and enrollment in senior secondary increased 29.1% for males (from 29.4% in 2018 to 58.5% in 2019) and 28% for females (from 25.7% in 2018 to 54.5% in 2019; Ministry of Basic and Senior Secondary Education, 2019 & 2021). Figure 1.10 summarizes GER per educational level in Sierra Leone between 2018 and 2020. Although female participation in secondary education has increased, female enrollment rates in secondary school remain below male enrollment (UNESCO, 2022).

Figure 1.10 Sierra Leone — Gross Enrollment Rates Per Educational Level

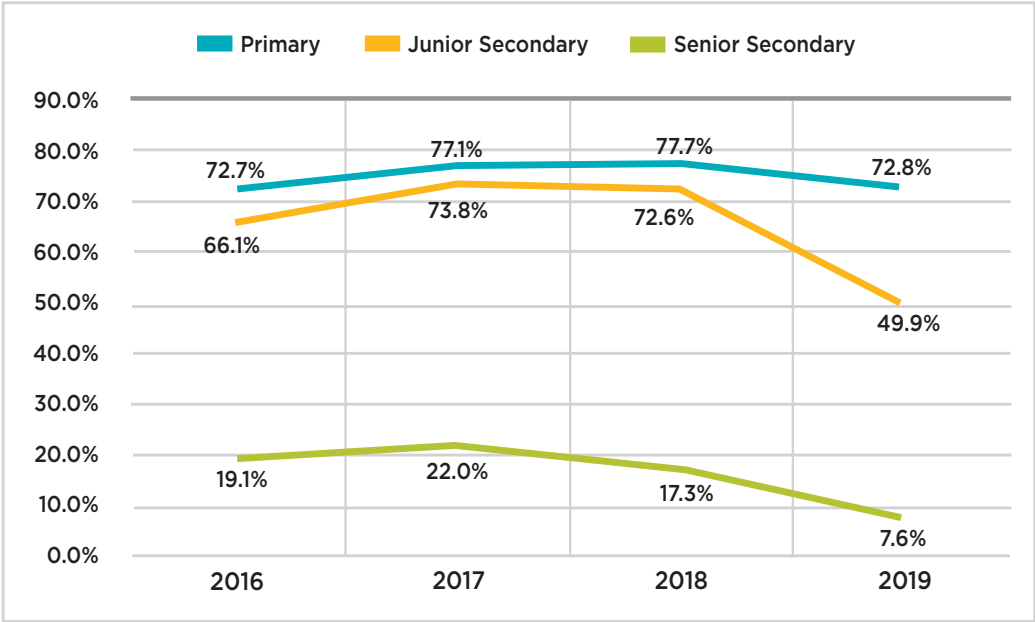


	Pre-primary	Primary	Junior Secondary	Senior Secondary
2018	12	107.8	61.5	27.5
2019	19.3	138.6	76.9	56.5
2020	20.6	136.9	77.9	59.1

Source: Authors using Sierra Leone's School Census Reports (Ministry of Basic and Senior Secondary Education, 2019 & 2021).

School performance in Sierra Leone is measured using standardized testing. In the final grade of primary school, students take the National Primary School Examination (NPSE); students that pass the NPSE move onto junior secondary school. In junior secondary, students take the Basic Education Certificate Examination (BECE) and go on to take the West African Senior School Certificate Examination (WASSCE) in senior secondary. NPSE pass rates between 2016 and 2019 are above 70% with an average of 75.1%. BECE pass rates show an increase between 2016 (66.1%) and 2017 (73.8%) and a significant decline between 2018 (72.6%) and 2019 (49.9%). Pass rates for WASSCE are consistently low and follow similar trends as the BECE with a slight increase from 2016 (19.1%) to 2017 (22%) followed by a drop in 2018 (17.3%) and 2019 (7.6%) (DTSI, n.d.). Figure 1.11 shows a summary of national average standardized tests for primary, junior secondary, and senior secondary levels.

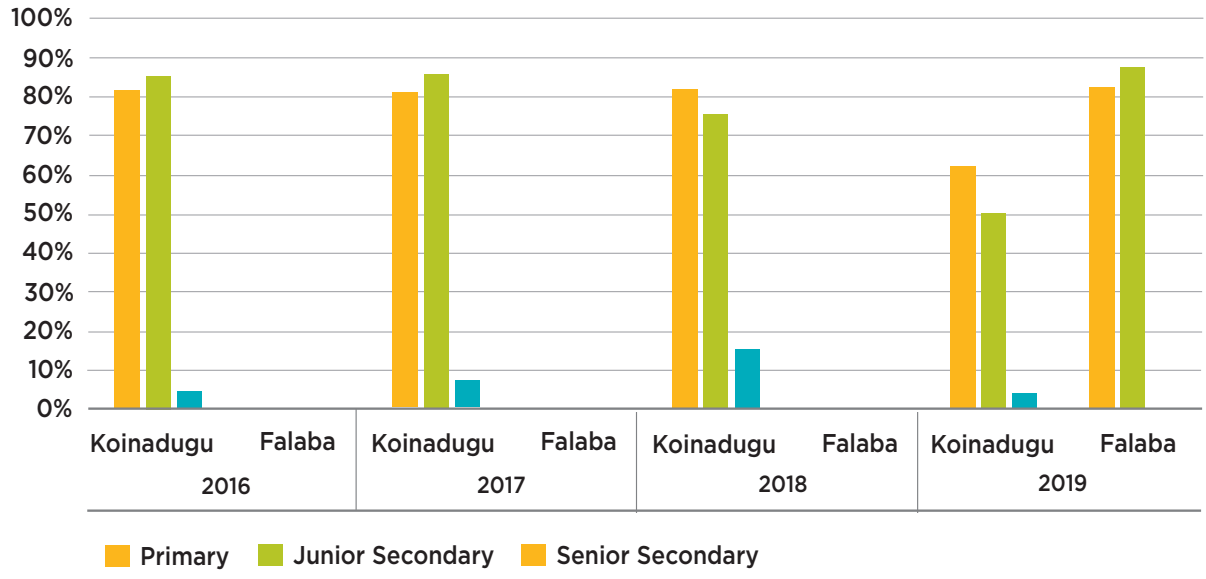
Figure 1.11. Sierra Leone — Results of Standardized Testing in three different Educational Levels (NPSE, BECE and WASSCE)



Source: Authors using data retrieved from DTSI, n.d.

Figure 1.12 shows standardized testing results for primary (NPSE), junior secondary (BESE), and senior secondary (WASSE) levels in the Koinadugu and Falaba districts, the implementation sites of the MGD program projects in Sierra Leone. Compared to the national scores for primary education, the Koinadugu district, students scored higher than the national average in 2016, 2017, and 2018, but scores dropped below the national average in 2019. Meanwhile, primary school students' 2019 scores are higher in the Falaba district than the national average for the same year (data for previous year on this indicator is not available for the Falaba district). BECE test scores are slightly higher than the national average in Koinadugu between 2016 and 2018 and almost the same in 2019. Interestingly, scores from the Falaba

Figure 1.12 Sierra Leone — Results of Standardized Testing at Three Different Educational Levels (NPSE, BECE and WASSCE) in MGD Implementation Districts (Koinadugu and Falaba)



Source: Authors using data retrieved from DTSI Education Data Hub, 2022

district are 37 points higher (87.6%) than the national average (49.9%). Although primary and junior secondary scores are, on average, better in Koinadugu and Falaba than the national average, WASSCE scores are lower than the national average in the Koinadugu district (data for this indicator is not available for Falaba district). Trends in education, as illustrated in this section, show that the higher the educational level, the lower the enrollment rates. Similarly, scores on standardized tests are better in primary schools and scores worsen as educational level increases. The next section will discuss how national level policies in Sierra Leone have contributed to increased access to education, particularly in primary schools.

Policy Framework for School Feeding in Sierra Leone

To understand the institutional framework for school feeding programs, we conducted a review of policies that include specific actions or mentions of school feeding programming in Sierra Leone. Our policy analysis includes a desk review of 30 policy documents formulated between 2005 and 2021, of which 25 were identified as relevant to school feeding programming in Sierra Leone. Policies were classified by sector under the following categories: [1] National Strategic Plans, [2] Education, [3] Health and Nutrition, and [4] Agriculture. This review was thoroughly conducted. However, this is by no means an exhaustive list, but it does give an indication of the many programmatic and policy frameworks for school feeding. This report presents the main highlights per policy area.

Sectoral Policies

National Strategic Plans

Sierra Leone faced human development and economic growth challenges in the transition period from a decade long civil conflict toward the rebuilding of a peaceful society. International donors and financial institutions provided a great deal of transitional support at that time. Institutions like the World Bank (WB) and the International Monetary Fund (IMF) collaborated with the Government of Sierra Leone to prepare the Poverty Reduction Strategy Papers (PRSPs), a mechanism to plan macroeconomic, structural, and social policies in support of economic growth and poverty reduction. Since 2005, there have been three PRSPs in Sierra Leone. The first PRSP, "A National Programme for Food Security, Job Creation and Good Governance (2005 – 2007)", was published in 2005. This PRSP has six pillars, including one on human development, where actions on the education sector are detailed. According to PRSP I, the main policy objective of the education sector is to "expand access to basic education with focus on the girl child", and it calls for action to expand the national school feeding program and support the development of school gardens.

The PRSP II was launched in 2008 under the name "Agenda for Change (2008-2012)". One of the strategic priorities under PRSP II is "Sustaining Human Development" which includes strategies for the education sector. Following the priorities in PRSP I, this paper seeks to increase access to and contribute to increasing completion rates of primary schooling, especially for girls and out-of-school children. One of the activities expected to contribute to achievement of this goal was the implementation of school feeding programming because it "is one of the interventions that can be used to ensure retention and completion." This document acknowledges that donor led programs, like the ones supported by the WFP and the CRS, are limited to certain geographical areas and to a small proportion of children in need of access to school feeding. The Agenda for Change document expressed the government's commitment to school feeding as a way to complement donor-led efforts. PRSP III was released in 2012 under the title "Agenda for Prosperity (2013-2018)". Pillar 3 of this strategy calls for "Accelerating Human Development", with the overall goal being "to reduce education-related inequalities toward universal education and provide high-quality learning opportunities at all educational levels for all women and men". Under this goal, the strategic objective "improved access, completion and equity of opportunities for education" makes references to school feeding. However, the document does not provide specific school feeding programming details and/or actions meant to achieve the described goals and objectives.

In 2019, the government of Sierra Leone launched the Medium-Term National Development Plan (MTND) (2019-2023) which has 6 pillars that focus on trying to "Strengthen Social Protection Systems". This policy document states that malnutrition is a major factor in delayed learning capacity among children which ultimately affects the building of human capital. The MTNDP strategy for tackling nutrition related challenges includes the utilization of school feeding as part of an integrated social protection measure; thus, one of the

proposed actions is to "provide cash and in-kind transfer packages as appropriate in education, health, nutrition, and shelter for disadvantaged children, women, girls."

In the intergovernmental sphere, the United Nations (UN) released the Sierra Leone United Nations Development Assistance Framework (UNDAF) 2015–2018 in 2015. One of the pillars leading this effort is "strengthening social protection systems". Under this pillar, the framework added two outcome indicators that impact nutrition of school aged children: Outcome A: "By 2018, vulnerable populations including adolescent girls have increased access to livelihoods, education and improved nutritional status." The corresponding activity is: "Supplementary feeding performance rates among targeted children under 5". The second outcome (Outcome B) is "by 2018, 20% of extremely poor households have access to social safety nets"; the corresponding action is "school attendance among children in beneficiary households of cash transfers and school feeding programme beneficiaries". The WFP led these set of activities and is responsible for outcome tracking.

Education

Currently, the lead agency in the education sector in Sierra Leone is the Ministry of Basic and Senior Secondary Education (MBSSE). In the recent history of Sierra Leone, the passing of the Education Act of 2004, is significant for the education sector, as it declared basic education to be both free and compulsory. In 2007, the Government of Sierra Leone launched the Education Sector Plan: A Road Map to a Better Future 2007-2015. Its primary goal is "to provide six years of good quality universal primary education to all children of primary school-going age (6-11 years) and the over-aged who had missed out - including those with special needs for both categories specified and ensure that they all complete with necessary knowledge and skills." The plan acknowledges that school completion is a challenge and considers that school feeding program expansion can help to improve school completion. The document states that, "There is a need to expand the school feeding programme to the other schools in the other districts which would not only encourage the children to access school but to stay without absenting themselves for lack of food. This would also help to improve primary completion". This policy document states that, to expand school feeding, the government of Sierra Leone needs to continue its collaboration with international donors like the WFP.

The National Education Policy of 2010 includes a section on crosscutting issues that impact school feeding action. The issue of "rights and protections" has a section focusing on health and nutrition. The goals of this focus area that pertain to school-aged children include: [1] extend and sustain school feeding programs for students in pre-schools and primary schools; [2] ensure linkage with Ministry of Health and other relevant government entities on matters related to school feeding and health; [3] encourage the establishment and maintenance of school gardens for food production and educational purposes; [4] include health and nutrition issues in the curricula for all children; [5] ensure that each school and educational institution has a source of safe drinking water and separate sanitation facilities for boys and girls.

In the early 2010s, the government of Sierra Leone began developing sectorial plans. The first Education sector plan was released in 2013 and designed a strategic framework for the 2013-2018 period. Under the 2013 education sector plan, school feeding is considered a mechanism that helps promote access to basic education in primary schools, improve education/quality of services, and provide a social safety net. Consistent with previous strategic plans, this document recognizes that school feeding programming has the capacity to increase enrollment and attendance as well as help to improve gender equality. From this moment on, the government of Sierra Leone began including the term "home-grown school feeding" as the preferred multisector approach to develop school feeding initiatives. A new education sector plan was released in 2018 and covers the 2018-2021 time period. This sectorial plan takes into consideration the negative effects that Ebola had on student retention and grade repetition rates. Given this, school feeding efforts remain an important social protection tool according to this policy document. In this context, the 2018 Education sector plan emphasizes the utilization of school feeding as a safety net mechanism for vulnerable families through activities like school meals provision but also take-home rations which contribute to alleviating food insecurity at the household level. For the first time, the education sector plan included indicators for school feeding: "An efficient community-based school feeding model linked to local production and procurement" with specific activities like "direct cash transfers to schools" (to be completed in 2016) and an "efficient model based on global best practice standard and in line with established national policy" (to be completed in 2020).

Along with this new education sector plan, the government launched the Free Quality School Education (FQSE) Program in 2018. This program is one of the flagship programs created under the leadership of President Julius Maada Bio. With the FQSE, the Government of Sierra Leone is committed to attaining universal primary education through activities that seek to increase enrollment in pre-primary educational institutions to 15% in 2020, increase enrollment and completion rates in primary schools to 85%, improve transition rates from primary to junior secondary schools to 92%, and improve school feeding programming for government and government-assisted primary schools (Sierra Leone National School Feeding Policy, 2021).

"School feeding in the national and sectoral policies is considered to be a mechanism or intermediate level action leading to educational outcomes improvement (e.g., attendance, enrollment, performance). Recently, the 2021 National School Feeding Policy (NSFP) incorporates efforts from previous policies into a cohesive and comprehensive policy document that provides details on the Government of Sierra Leone's approach to and priorities on school feeding."

Health and Nutrition

The Ministry of Health and Sanitation leads the health sector in Sierra Leone and has developed policies pertaining to nutrition as a major aspect of health. A national health policy was launched in 2002 that included nutrition related actions but did not mention school feeding actions. Similarly, the 2009 National Health Sector Strategic Plan (2010-2015) lists actions toward the improvement of population nutrition, but there are not specific mentions to school feeding. However, the same year, the Sierra Leone National Food and Nutrition Policy proposed a multisector approach to address problems of nutrition where the MBSSE is considered a key actor in the formulation of school feeding activities. This policy document establishes the following strategic objective: "To undertake advocacy for policy makers, policy advisors and programme designers at national and district levels at national and district levels on Nutrition issues and its relationship to development". The 2012 National Food and Nutrition Security Policy follows the same line of focus as the previous policy documents in advocating for a multisector approach to food and nutrition issues and assign responsibilities to the different ministries—like the ministries of Education and Agriculture.

Agriculture

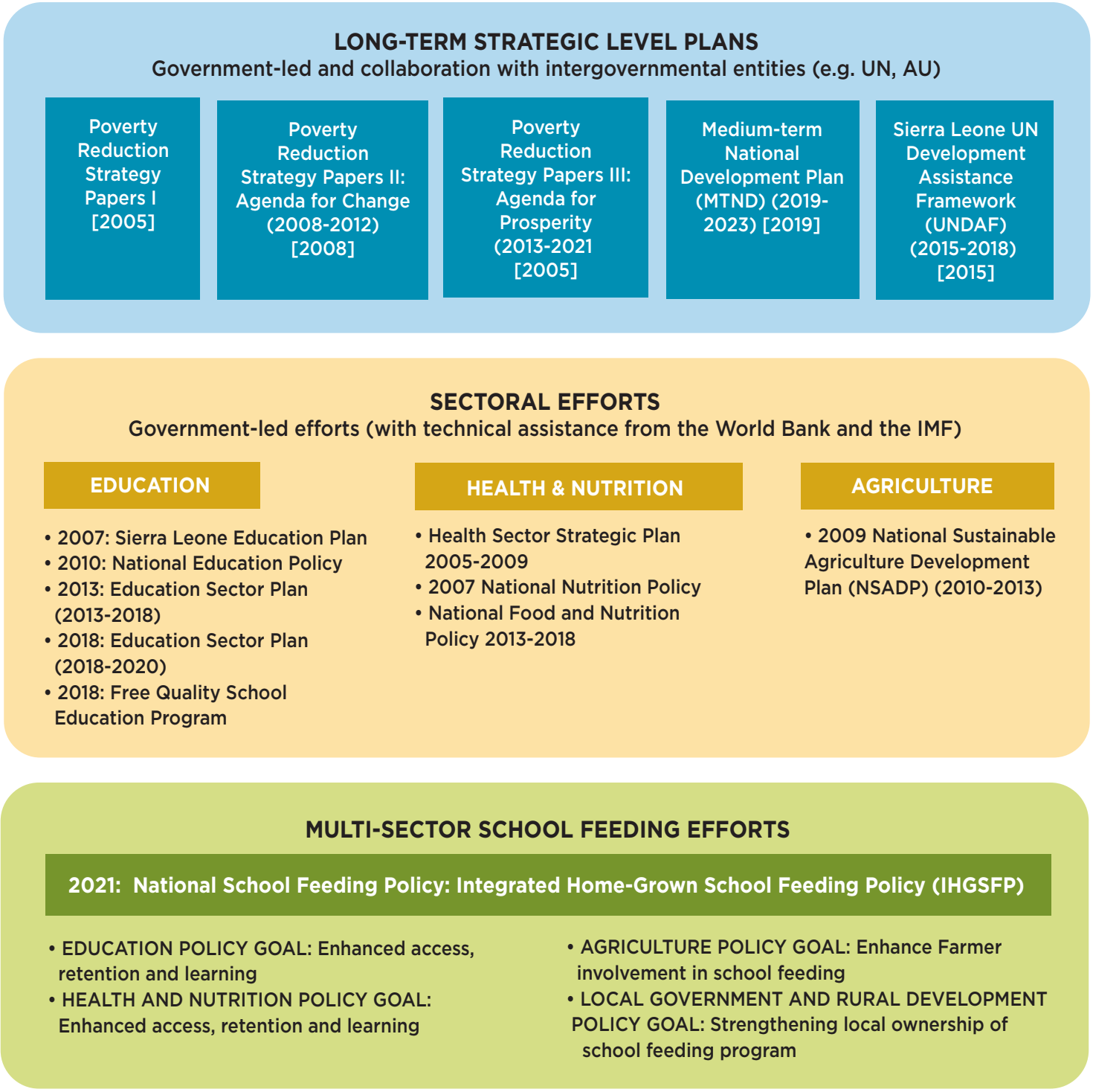
The Ministry of Agriculture, Forestry and Food Security is the lead government agency in Sierra Leone's agricultural sector. Under its leadership, the National Sustainable Agricultural Development Plan (NSADP) (2010-2030), a long-term strategic plan for improving the agriculture, forestry, and fisheries sector, created. The goal of this strategic sectorial plan is to develop Sierra Leone's capacity to address growing population pressures and economic growth. Additionally, "NSADP serves as the CAADP Compact (Comprehensive Africa Agriculture Development Programme) under the African Union's New Partnership for Africa's Development (AU/NEPAD) activities to assist countries and development partners to share a common vision for development" (NSADP, 2009, p. 8). Regarding school feeding, the NSADP highlights the need to use fruit and nut crops (e.g., Bananas, Mango, Pineapple, Coconut and Citrus) in school gardens. This type of work falls under sub-program 1, Commodity Commercialization – component 1, small holder commercialization scheme which includes smallholder farmer capacity building activities.

Figure 1.13 summarizes the policy framework for school feeding in Sierra Leone.

2021 National School Feeding Policy

The section above references the series of comprehensive and sectoral strategic actions aiming at including school feeding programming into the government action to improve nutrition among school-aged students. School feeding in the national and sectoral policies is considered to be a mechanism or intermediate level action leading to educational outcomes improvement (e.g., attendance, enrollment, performance). Recently, the 2021 National School Feeding Policy (NSFP) incorporates efforts from previous policies into a cohesive and comprehensive policy document that provides details on the Government of Sierra Leone's approach to and priorities on school

Figure 1.13 Sierra Leone — Policy Framework for School Feeding Programming



Source: Authors

feeding. The NSFP is the result of close collaboration between the Government of Sierra Leone, under the leaderships of the MBSSE, in collaboration with implementing organizations of donor led school feeding programs in the country—like the WFP and CRS. The goal of this policy is to develop "a decentralized and sustainable programme, based on the global home-grown model, that promotes human capital development through increasing access to education and learning opportunities and enhanced health and nutrition, and linked to local agricultural productivity and community growth" (Government of Sierra Leone, 2021, p. 11). Its "Integrated National Home-Grown School Feeding Programme" (IHGSFP) approach draws from the Home-Grown School Feeding Program (HGSF) model developed by the WFP and subsequently implemented in multiple countries across the globe. Given this IHGSFP approach, the government-led proposed school feeding model is expected to provide the following set of benefits:

1. Ensure national ownership of the school feeding program across different sectors and districts and communities.
2. Ensure efficient and reliable provision of healthy and nutritious school meals in pre-primary, primary, and junior secondary schools.
3. Ensure that school feeding increasingly generates benefits for smallholder farmers and local communities, and
4. Ensures that the Ministry of Basic and Senior Secondary Education continues to focus its resources on its core-responsibilities, including the promotion of free quality education while implementing the IHGSFP. (p. 10-11)

The policy document highlights the multisectoral aspects of school feeding efforts and expected outcomes. For this, there is a mention of the multiple governmental and non-governmental entities expected to participate in addressing this policy issue; these entities include but are not limited to the Ministries of Education, Health and Sanitation, Agriculture, Finance, foreign donors, and international organizations. The NSFP emphasizes five key policy pillars: access to education, health and nutrition, agriculture, rural development, and social development. These policy pillars appear to influence which state agencies oversee specific activities under the government-led school feeding effort.

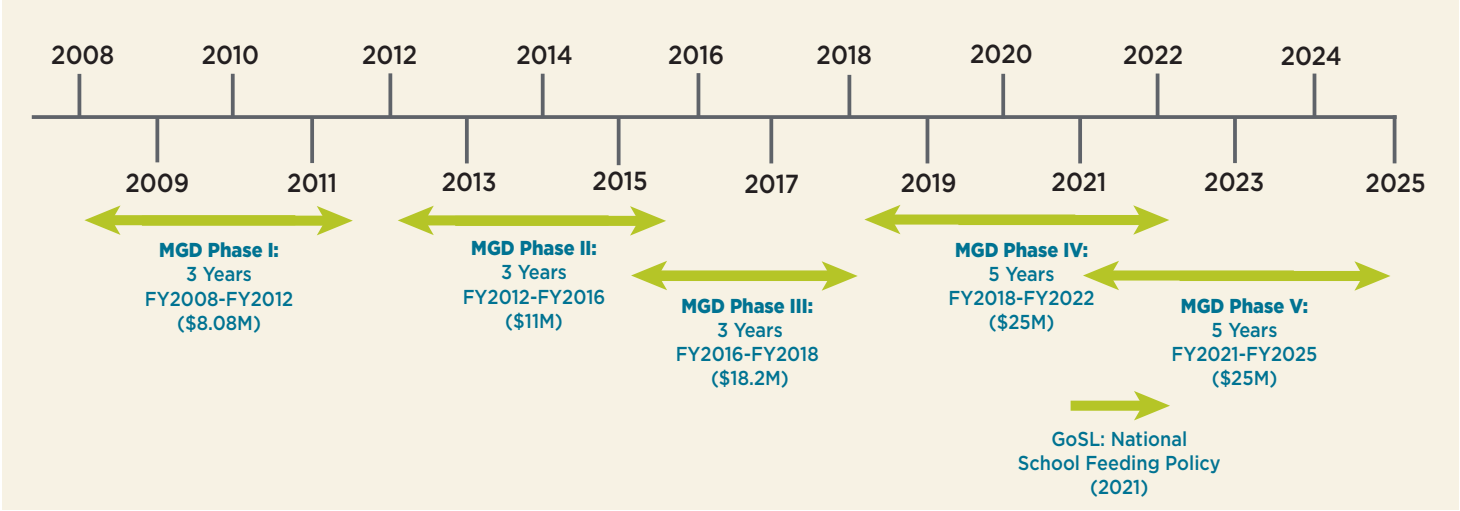
The Sierra Leone's NSFP is in its early stages, but it is expected that the use of the IHGSF approach in programming will yield positive outcomes in terms of the organizational structure, budgeting, multi-sector collaboration, and sustainable school meal provision. One of the elements that the policy highlights, is the need to continue collaborations with development partners while the Government of Sierra Leone develops capacity for ownership of the national program. Aside from the Catholic Relief Services' (CRS) implementation of MGD program, available information suggests there exist other parallel school feeding programs being implemented by other nonprofit organizations including the WFP, Plan International, Joint Aid Management (JAM), and the Government of Sierra Leone. The next section will present the main features of school feeding program implementation led by one of these development partners, the Catholic Relief Services (CRS). CRS's school feeding program obtained support from the USDA-FAS through the MGD program.

McGovern-Dole Food for Education and Child Nutrition (MGD) program implementation in Sierra Leone

Donor-led School Feeding Efforts in Sierra Leone

Because of poor nutritional, health, and educational outcomes among children (as described earlier in the institutional framework), private voluntary organizations (CRS and WFP) have been actively providing food aid, and related resources meant to target education, health, nutrition, and food insecurity in Sierra Leone, since the 1960s. CRS began working in Sierra Leone in 1963 with objectives that included the provision of both emergency aid and the promotion of education, health, agriculture, and urban resilience in Sierra Leone. The WFP came shortly after in 1968 to assist the Sierra Leonean government in battling malnutrition and food insecurity among vulnerable populations. Nevertheless, there are no early recorded attempts of school feeding program implementation in Sierra Leone. Given that Sierra Leone experienced a decade-long civil war, MGD project evaluation reports suggest that, despite inclusion in national and sectorial policies (see policy section above), school feeding programming did not begin until 2008 under the USDA funded MGD program following the Government of Sierra Leone's passage of the Education Act of 2004 that declared basic education to be both free and compulsory (SL.MGD.Baseline.2018-2022). Implemented by CRS, the MGD school feeding program has fully implemented three phases, is currently completing phase 4 and is beginning to implement phase 5 of MDG. Phase 1 project was implemented from 2008—2012 in the four chiefdoms of Sulima, Mongo, Neini, and Neya. Phase 2's project was implemented from 2012—2016; this phase expanded project coverage into a fifth chiefdom—Dembelia Sinkunia. Phase 3 was implemented from 2016—2018 in the same 5 chiefdoms. The current phase, phase 4, began in September 2018 and will end in September 2022 (2018-2022) and seeks to double the program's coverage to include 15 chiefdoms in the Koinadugu and Falaba districts (SL.MGD. Baseline.2018-2022). As of 2021, CRS is implementing MGD project activities in approximately 192 primary schools in the Koinadugu and Falaba Districts of Sierra Leone (Sierra Leone Country Fact Sheet April 2021). According to CRS staff, project phase 4 now serves 218 schools in Koinadugu and Falaba and seeks to serve up to 310 schools as the project moves into phase 5 (Sierra Leone Interview 2021) (Figure 1.14, depicts a timeline of MGD implementation in Sierra Leone).

Figure 1.14 Timeline of MGD Implementation in Sierra Leone



MGD programmatic changes across different phases

The MGD school feeding program's main goal is to improve student literacy skills and nutritional and health status by providing school meals to pre-and primary school children. The provision of school meals is a mechanism through which the program is working to improve school enrollment, attendance, and student attentiveness while also addressing gender inequality by strongly emphasizing gendered programming. CRS has implemented all 4—soon to be 5—phases of MGD school feeding projects in Sierra Leone. Throughout each phase, the program sought to increase coverage and establish a sustainability framework that would allow the Government of Sierra Leone to eventually implement school feeding in all of the government-owned primary schools without donor support. Phase 1's (2008-2012) MGD project began by targeting school feeding project implementation in four chiefdoms in one of the most marginalized districts, Koinadugu. This first phase of implementation mainly emphasized the provision of school meals, with special emphasis on providing take-home rations for girls in upper primary school, while also incorporating aspects of school feeding infrastructure and capacity building. These activities include providing training to school management committees, distributing teaching and learning materials and furniture for schools, and an overall improvement of school infrastructure. During these initial phases, food used to make school meals and other school-related material resources were fully supplied by the USDA and USDA's commodity in-kind contributions. Students at targeted schools reportedly received two in-school meals per day and take-home rations were provided for female students. In terms of the education component, most resources suggest that this initial phase mainly focused on food provision in an effort to greatly encourage student school attendance as school attendance rates were reportedly very low.

"CRS has implemented all 4—soon to be 5—phases of MGD school feeding projects in Sierra Leone. Throughout each phase, the program sought to increase coverage and establish a sustainability framework that would allow the Government of Sierra Leone to eventually implement school feeding in all of the government-owned primary schools without donor support."

MGD Phase 2 (2012—2016) saw an expansion in the coverage of the MGD program, an increased focus on education and teaching methods, and an emphasis on student household food insecurity. The program expanded to include a 5tth chiefdom, Dembelia Sinkunia, and added an additional 75 schools from the existing chiefdoms already included in prior project phases. Teacher training, specifically in-service teacher training on Diagnostic Teaching Methods (DTM) meant to improve on literacy instruction and training some teachers to attain their Certificate General (TC General) so that they are certified instructors. Further, phase 2 also saw the extension of the first Savings and Internal Lending Committees (SILC) which were created to help strengthen the financial status of households in the targeted school chiefdoms. In addition, an increase in the number of schools meals from one school meal to include two school meals occurred. Gendered programming, specifically take-home rations for upper primary school girls, continued with the stipulation that only girls who maintained a minimum of an 85% attendance rate could receive these rations (SL.MGD.Baseline.2015-2018).

Over the course of Phase 3 (2016—2018), the government of Sierra Leone elected a new president. This governmental change gave way to increased government prioritization of education. During this time, the government of Sierra Leone established the Free Quality Education program (2018) which not only sought to expand the national school feeding program but also provide textbooks, uniforms for students, and tuition-free education for qualifying government-approved primary and secondary schools. Major changes during this phase included a decrease in in-school meals provided daily—from two school meals to one school meal (a midday lunch)—and a change from bulgur to fortified rice as a staple school meal commodity. These changes were reportedly made to align the school meals component of phase 3's MGD project with the Government of Sierra Leone's proposed school feeding program (SL.MGD.Baseline.2015-2018). CRS staff also increased the number of literacy activities by increasing staff that primarily trained early grade teachers. Phase 3 also saw the establishment of reading clubs and the provision of solar lights so that reading clubs could meet at night. Lastly, because of the Ebola crisis, phase 3 included an increased focus on teaching better dietary practices and improving overall student and community member health at project schools.

The end of Phase 4 and the beginning of Phase 5 also included important changes in school feeding coverage, future sustainability, and project graduation. In phase 4 (2018-2022), the project's coverage increased from 32,684 to include 69,731 primary school students (from 192 schools to 310 schools) in the Koinadugu district; this increase also included an increase in geographic area as the project implementation area increased from 5 chiefdoms to 15 chiefdoms. Additionally, the Falaba district, a new administrative unit created from the current Koinadugu district in 2016, was included in Phase 4. Further, this phase pushed to prioritize activities and relationships from the prior phases to establish project sustainability with help from the MBSSE. Currently, the program is working with the MBSSE to slowly transfer the ownership of the school feeding programming to the government of Sierra Leone while also using a sustainability framework for program implementation to increase program effectiveness and efficiency. Some of these activities include using a call-in feedback service so that school feeding beneficiaries can provide project feedback to CRS, building school authorities and local community capacity by establishing and maintaining greenhouses and school gardens, providing WASH infrastructure via the construction of boreholes, and supplying classrooms with teaching and learning materials (CRS Sierra Leone PMP FFE-636-2018-007-00). Lastly, this phase and phase 5 (began in September 2021 and will run 2021—2025) are focused on readying the Sierra Leone MGD school feeding program for graduation through other sustainability efforts like introducing the LRP component in Phase 5 (SL.MGD.Endline.2015-2018). Table 1.12 summarizes the scope of work of MGD in Sierra Leone.

While Sierra Leone's MGD activity does not currently have an LRP component, CRS has been involved in many planning activities associated with the future LRP component in Phase 4 and 5. For example, Sierra Leonean schools under the current project do have school gardens. School gardens are expected to supplement school feeding program meals with diversified foods. As of phase 4, there were 50 school gardens and CRS plans to expand to upward of 100 school gardens throughout phase 5. WFP, World Vision, Plan International, and KIA are also working together to understand the utility of implementing an LRP component in Sierra Leone. Currently, communities do not play a large role in supplying food for their respective school feeding programs but will take on the responsibility of management of commodity transportation, food procurement, and school feeding food supply monitoring by utilizing the complaint reporting system that CRS is currently implementing. Additionally, in order to target smallholder and local farmers, CRS is using a consultant group to perform a market study (mapping assessment study) to determine market accessibility to identify potential smallholder farmer groups who will be able

Table 1.12 MGD in Sierra Leone: Scope of Work from Phases 1 to 4

Project Phases	Timeline	Geographic Area	Pupils Reached
I	2008-12	4 chiefdoms	25,128
II	2012-16	5 chiefdoms	28,585
III	2016-18	5 chiefdoms	32,684
IV	2018-22	15 chiefdoms	69,731

Source: Adapted from Table 1 of the report: Timeline of All Pinkin for Learn Project Phases; SL.MGD Baseline. 2018-2022

to produce food for school feeding. The commissioned study is trying to assess the cost implications of school feeding commodities when choosing to procure food locally. This market analysis will reportedly be completed a few months before LRP component implementation begins so that CRS has a better understanding of the current landscape of the food market before starting the LRP component in the later term of Phase 5.

MGD Programmatic Components and Outcomes in Sierra Leone

McGovern-Dole school feeding project efforts in Sierra Leone include a set of programmatic and comprehensive activities seeking to mainly improve literacy and educational outcomes of school-aged children. These educational programmatic components target student and teacher attendance using the provision of school meals—a school lunch—and take-home rations (for female students; see Table A in appendix 1.2). Further, the MGD school feeding program has components that focus on improving nutrition and health outcomes and dietary practices among program participants. This section will report the main project outcomes classified under the following categories: education and literacy, nutrition and health, and WASH/SWASH.

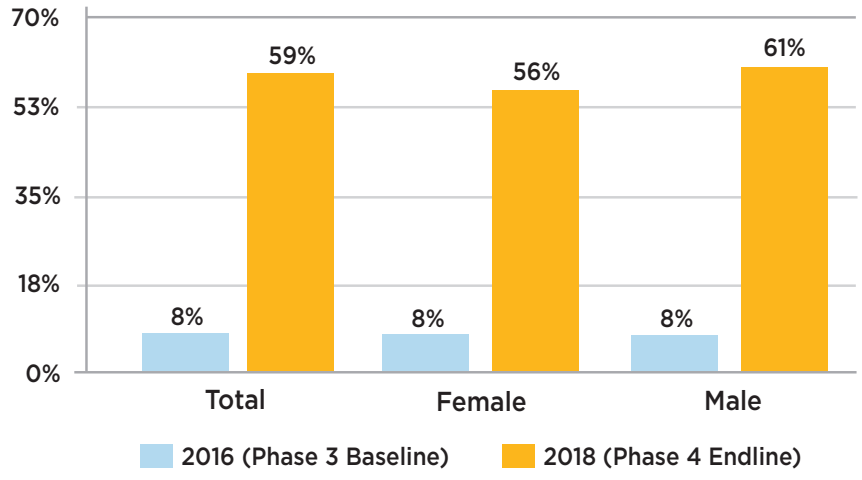
Education and Literacy

The education component of MGD seeks to improve student literacy outcomes with a specific focus on reading and reading comprehension. MGD indicator "Percent of students who, by the end of two grades of primary schooling, demonstrate that they can read and understand the meaning of grade-level text" was used to capture education outcomes associated with student reading ability. This indicator shows an approximately 48% improvement (from 8.3% in 2016 to 56% in 2018) in female student performance and an approximate 53% (from 7.9% to 61%) improvement in male student literacy performance among MGD project participants in Phase 3 of the program (see Figure 1.15). It is important to note that student literacy was measured using the Early Grade Reading Activity (EGRA) tool until the middle of phase 3. Literacy at the end of Phase 3 and in Phase 4 was measured using a new literacy assessment tool adapted from the UNICEF national literacy assessment tool Dr. Johanna Kuyvenhoven, a literacy educator from Calvin College (SL.MGD.Baseline.2018-2022). Therefore, student literacy measurements in Phase 4 (2018) are only 5.58%, but this is likely a factor of increased coverage of the MGD school feeding project.

Other sub-objectives of improved student literacy include improvements in the quality of literacy instruction, improvements in student classroom attentiveness, and improvements in student and teacher attendance in targeted schools. Some activities used to foster these improvements include teacher trainings, school feeding, and the provision of teaching and learning materials. For example, the MGD program trains teachers to make sure they are using the best teaching techniques and tools to facilitate student learning. As illustrated by the MGD indicator "Number of teachers/educators/teaching assistants in target schools who demonstrate use of new and quality teaching techniques or tools as a result of USDA assistance", there was a consistent increase in the number of teachers utilizing new, quality teaching techniques or tools in MGD classrooms throughout Phase 3 (see Table A in appendix 1.2). CRS's focus on teacher training has reportedly helped to address

Figure 1.15 MGD School Feeding Literacy Outcomes

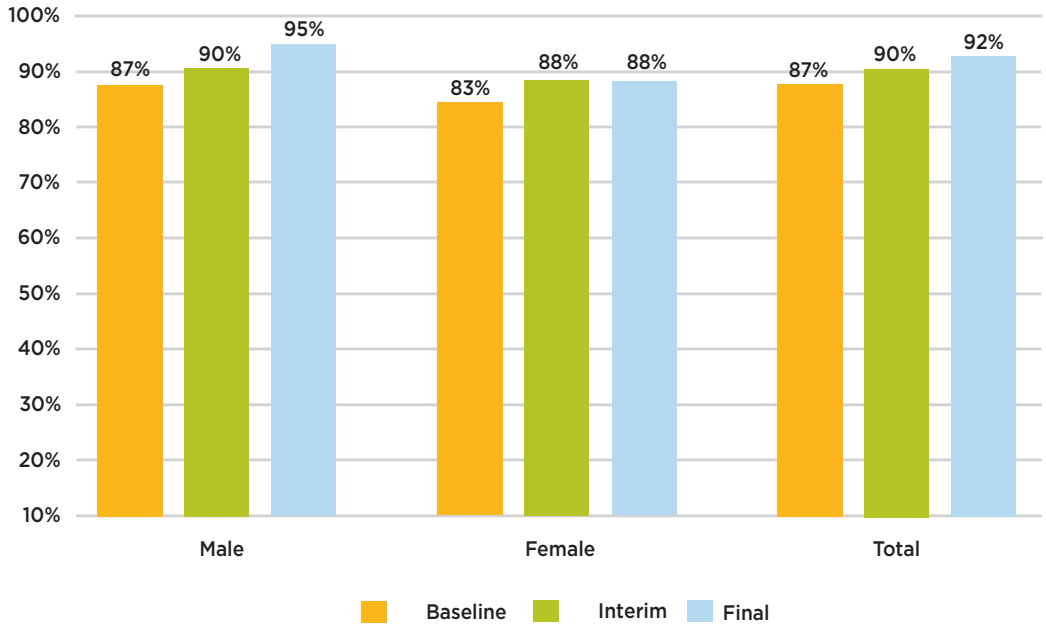
Percent of students who, by the end of two grades of primary schooling, demonstrate that they can read and understand the meaning of grade-level text



Source: Authors using MGD Sierra Leone program performance data provided by USDA-FAS.

the "gap between trained and qualified teachers and untrained and unqualified teachers in Sierra Leone" according to one Teach for Sierra Leone staff member. Improvements in student enrollment, attendance, and teacher attendance were achieved by providing students who attended school and teachers with access to daily school meals which increased MGD program satisfaction for teachers and incentivized students to attend school. For example, the average student attendance rate increased in Phase 4 from 68.1 to 77 ("Average student attendance rate in USDA supported classrooms/schools"). Additionally, the average number of students enrolled increased throughout Phase 3 and Phase 4 ("Number of students enrolled in schools receiving USDA assistance") supply/school meals component of the MGD school feeding project (SL.MGD.Endline.2015-2018, p. 33). According to MGD evaluation reports, classroom attentiveness was defined as "pupils asking questions, actively participating in lessons, and following instructions without distraction" and evaluation findings suggest that classrooms observed in the final evaluation of Phase 3 were more attentive than they were when measured at the baseline and midline Phase 3 evaluations (SL.MGD.Endline.2015-2018, p. 44). Overall, findings suggest that on average "64 percent of classrooms in the final evaluation [of phase 3] showed moderate or extensive evidence of student attentiveness" (SL.MGD.Endline.2015-2018, p. 44).

Figure 1.16 Teacher Attendance Rates at the Endline of Phase 3



Source: Authors using WFP information from SL.MGD.Endline.2015-2018, p. 35

(see Table A in appendix 1.2). According to the phase 3 evaluation report, teacher attendance (a sample of 164 teachers; 87% Male, 13% Female) increased in a consistent manner throughout phase implementation (see Figure 1.16; SL.MGD.Endline.2015-2018, p. 35).

Subsequently, over the course of Phase 3, the number of daily school meals and take-home rations provided to school children and to teachers, on average, increased throughout Phase 3 for students and teachers and throughout Phase 4 for students only (see Table A in appendix 1.2). Additionally, evaluation reports suggest that most teachers in the final evaluation sample (N = 180) reported being very satisfied with the food

Nutrition and Health

Some activities meant to increase the use of health, nutrition, and dietary practices included training sessions meant to teach students, teachers, administrators, and community members about food, nutrition, and balanced meals. With a focus on executing nutrition based on the Infant and Young Child Feeding Practices (IYCF) which targets nutrition resources for pregnant and lactating mothers under age five, CRS used the nutrition component to hold both formal and informal child nutrition training sessions with follow-ups for pregnant and lactating women and women with infants under age

5. While there is not consistent data on IYCF activities, data reported for the indicator "Percent of participants of community-level nutrition interventions who practice promoted infant and young child feeding behaviors" show that 50% of community-level participants in nutrition interventions practiced behaviors taught at the beginning of phase 4. Additionally, in Phase 4, approximately 80 children under the age of five received nutrition-specific interventions as a result of the community health programs implemented within this MGD project and 60 pregnant mothers received nutrition-specific interventions ("Number of children under five (0-59 months) reached with nutrition-specific interventions through USDA-supported programs" and "Number of pregnant women reached with nutrition-specific interventions through USDA-supported programs"; see Table B in appendix 1.2). While beneficiaries of interest in MGD projects are mainly school-aged children, IYCF practices are included in project implementation, and the measurements are established in these MGD indicators. CRS also worked with Mother Support Groups (MSGs)/Mothers Clubs in the targeted school communities, along with school health clubs, to train parents, administrators, and teachers on how to monitor the school feeding program and monitor child nutritional status. For example, results from Phase 3 show an increase in the number of (MSGs) that received support as a result of the MGD program ("Number of Parent-Teacher Associations (PTAs) or similar "school" governance structures supported as a result of USDA assistance MSGs"). CRS engaged with parents, families, and the local communities in targeted areas to help improve community health and dietary practices and gather community feedback on current implementation of the school feeding program. These types of activities contributed to increase community ownership of school feeding.

Other practices meant to target student health in an effort to reduce health related absences include the use of trained medical workers (~ 930 in 310 schools in phase 4) that go into the field to provide community health screenings wherein they screen children for malnutrition. Students found to suffer from malnutrition are then referred to Peripheral Health Units (PHUs)—or local government-run clinics established and controlled by the Ministry of Health and Sanitation that provide everyday healthcare to the citizens of Sierra Leone—to be treated. PHUs also provide prenatal and postnatal care and childhood vaccinations, immunizations, and deworming to many of the communities targeted by MGD. There are 59 PHUs working in the 15 chiefdoms and, according to indicator data, the number of student deworming increased over the course of phase 3 ("Number of students receiving deworming medication(s)"; see Table B in appendix 1.2).

WASH/SWASH

The WASH component was used to improve student, school personnel, and community knowledge about health and hygiene practices, increase access to clean water and sanitation, improve food preparation, handling, storage, and cooking practices, and improve health and hygiene related infrastructure. WASH activities often consist of establishing school health clubs, creating menstrual and hygiene management systems, and training and teaching female teachers, parents, administrators, and children on health and hygiene practices. Training includes information on the proper use of menstrual management rooms, how to create reusable sanitary pads, social behavior change, and communications (SBCs) meant to increase the adoption of health and hygiene behaviors in schools. In Phase 5, CRS staff plan to increase sustainability of the WASH component activities by forming an infrastructure management committee at each school that will help with "the construction of a wash friendly schools in our different intervention areas" which places the responsibility of building and upkeep of WASH infrastructure in the hands of each targeted community. Indicators support the occurrence of these activities. For example, a total of 115 latrines were constructed/rehabilitated throughout phase 3 of MGD implementation ("Number of educational facilities (i.e., school buildings, classrooms, improved water sources, and latrines) rehabilitated/ constructed as a result of USDA assistance (latrines)") and a large number of schools were reportedly using an improved water source at the end of phase 3 and in phase 4 ("Number of schools using an improved water source"). Further, educational WASH related facilities have been constructed throughout phase 3 and 4 and a number of WASH clubs were formed in phase 3 ("Number of educational facilities (i.e., school buildings, classrooms, improved water sources, and latrines) rehabilitated/ constructed as a result of USDA assistance" and "Number of WASH clubs formed"; see Table B in appendix 1.2 for a summary of performance indicator results on the WASH component).

Partnerships for School Feeding in Sierra Leone

There are ongoing efforts by MGD to forge partnerships with relevant government and non-government institutions working in the educational sector in Sierra Leone. From the programmatic standpoint, MGD acknowledges the critical role partnerships play in implementing the school feeding program and fulfilling project objectives, and further to develop a sustainable model for a government-owned school feeding program. This awareness is reflected in CRS's implementation approach through the different set of activities, including capacity building and a collaborative mindset. For instance, there has been close collaborations with public institutions, mostly the MBSSE and the Ministry of Health and Sanitation, the major and often mentioned partners associated with MGD project implementation. But partnerships from MGD implementation in Sierra Leone expand the public sector and include other public institutions, local and international nonprofits, and community organizations.

In Sierra Leone, nonprofit organizations are at the forefront of school feeding interventions; key actors include the WFP, CRS, JAM, UNICEF, CARITAS, Plan International, and Care International. These organizations perform diverse roles, not only on school meal provision but also providing teaching and learning materials, building relevant institutional capacity, training and policy support, and facilitating the certification and recruitment process for front-line staff in the education sector. These organizations had also played a critical role in policy formation, as shown by their participation in the policy making process of the Sierra Leone NSFP launched in 2021. This section will present the key findings of the analysis of key partnerships existing in the implementation of MGD in Sierra Leone and its potential connections with the larger Government of Sierra Leone's NSFP.

The NSFP suggests that the government is going through a transition state where development partners, including CRS, hold an important role in the implementation of school feeding programs throughout the country. Despite the relevance of development partners in school feeding programming, there must be efforts (from both development partners and the government) to build capacity among the government institutions to allow the phase out of current development-owned programs towards the government ownership of the school feeding activity. Therefore, a school feeding program like MGD has the possibility to embed capacity building efforts in its program activities. As detailed in the previous section, the first four stages of MGD focus on school meal provision, improvement of learner's outcomes, health and nutrition, and WASH. Phase 5 of the program has a strong focus on building sustainability, which include efforts to develop capacity among government agencies, and strengthen collaborations across sectors and government and non-government institutions.

Interview data collected for this study suggest that the current interpretations of partnership objectives under MGD prioritize gaining project implementation support from relevant government institutions with CRS playing a lead role in the direct implementation of the school feeding program. While this implementation approach has been much easier to manage due to reduced decision-making bureaucracy, just until recently, with the beginning of Phase 5 of MGD strategies to foster government ownership of the school feeding program and capacity development for the transition toward an IHGSF has been included in the program. A participant during an interview noted the main objective of the CRS's partnerships under the MGD program:

The main aspect in terms of partnerships is to ensure that implementation is effective, efficient, and relevant to the people and that each and every partner has or the most developed a specific understanding between them and CRS. So like, for example, Caritas partnership is more on how to implement health-related activities in schools using life skills approach with the kids and then you have other partners who are also using some different approaches.

Given this context, MGD in Sierra Leone could adopt a co-implementation approach wherein all relevant state agencies assume a lead role in school feeding with respect to their relevant sectors. This strategy would further

government ownership of the program and facilitate the transition toward a government-owned school feeding program. Relevant state institutions should be seen as co-implementers and not as a source of technical assistance for CRS in Sierra Leone, and the same should be communicated to the government of Sierra Leone's institutions at all levels. This section presents the results of the analysis of partnerships for school feeding in the context of MGD implementation in Sierra Leone.

Partnerships with the Public Sector

The NSPF (2021) is the official blueprint for the development of a government owned school feeding program in Sierra Leone; the NSFP policy prioritizes some key pillars as cited in the previous sections; these pillars align with the mandate of key state institutions, including the a) Ministry of Agriculture, b) Forestry and Food Security, c) Ministry of Social Welfare, Gender and Children's Affairs, d) the Ministry of Health and Sanitation, and e) the Ministry of Local Government and Rural Development. The policy strategies outlined in the NSFP make partnerships with the above-listed public institutions key to the implementation of school feeding. Under the MGD program, CRS's most frequently cited partners include the MBSSE and the Ministry of Health and Sanitation. There is evidence of an ongoing joint effort between CRS under MGD and these government institutions, especially in monitoring, school capacity building, and implementation of project activities. Table 1.13 summarizes the key partnerships with the public sector under the MGD implementation in Sierra Leone.

Regarding the focus on the partnerships with the education and health public sectors, a CRS staff member noted during an interview:

For example, training of cooks in different aspects, and then two we also trained the school management committee DMCs (District Management Committees) other related to ensure they take cognizance of food supply in schools. And then, like others, we train them on health and hygiene on critical time of washing their hands during preparing meals you know and Uhm, you mentioned them, you already mentioned them.

A different staff member noted the working relationship between CRS staff and the MBSSE within the MGD program projects:

I know there are close engagements within the two (education ministry and MGD), and they work together to target beneficiaries; they work together to implement the program.

The participant further noted:

The Government provides their own monitoring mechanism and regulatory mechanism to ensure that the benefits of the program are reflected in the development of the children within the schools and a range. So you have the people within the ministry who also focused on school feeding, working with the CRS team in developing the programs, implementing the programs, being the targeting, providing the support, and also doing monitoring and supervising the case. Most of the activities are undertaken jointly; the

Table 1.13 Summary of Public Partnerships for School Feeding Under MGD Sierra Leone

PARTNER	CONTRIBUTIONS TO SCHOOL FEEDING
MBSSE - Ministry of Basic and Senior Secondary School Education	They have the overall responsibilty for the government-led IHGSF program. The ministry provides training, technical and financial, and supervisory support in the implementation of the IHGSF program in Sierra Leone.
The Ministry of Health and Sanitation	The Ministry of Health and Sanitation provides deworming and health education services in schools and communities. The MoHS also provides community health workers and school health facilitators to implement health and nutrition components of MGD projects.
Ernest Bai Koroma University	They provide training and certification resources to teachers to get them approved by the government to teach in public schools.
Northern Polytechnic Teacher Training College (NP)	NP provides teacher certification through a distance education program in the project areas.
Ministry of Agriculture and Forestry	This ministry provides technical support in setting up and managing school gardens in beneficiary schools to complement the school feeding commodities.

government has a staff within the communities, and so does CRS as well, so they complement each other. That is my understanding."

Despite efforts to build relationships with relevant state agencies and adopt a multisector approach as emphasized by the NSFP, discussions with CRS staff suggests that MGD partnerships are mainly with the Education and Health ministries and intermittently with the Ministry of Agriculture. The complex nature of the social factors that hinder access to education makes multisector partnership in the education sector imperative to attaining the goal of universal primary education in Sierra Leone. There is a general willingness by government institutions to partner with MGD to implement the school feeding in Sierra Leone, even though actual engagement remains limited to few government institutions.

Besides the education and health ministries, CRS through MGD has partnered with other public institutions, such as the Northern Polytechnic Teacher Training College, to increase access to continuing education and teacher certification resources. For example, through the partnership with Northern Polytechnic Teacher Training College, CRS successfully implemented a remote educational program and certification pathway for primary teachers in the Koinadugu district. This partnership enabled teachers in rural and hard-to-reach areas to have access to additional educational hours and government teaching certification preparation which allows them to teach in public schools.

MGD's readiness to work with public institutions has been demonstrated; identifying and forming working relationships relevant to the transition toward Sierra Leone's IHGSFP is an ongoing process and is in its early stages. Forming the right partnerships require conscious guidance in building sustainable and mutually beneficial working relationships with government institutions as co-implementers, not only as a source for technical assistance in the implementation process.

Despite the willingness of state institutions to engage and partner with MGD in the implementation of school feeding, these partnerships have been significantly shaped by the flow of resources-- logistical, and technical support mainly from MGD to these government institutions. The current partnership dynamics could create an overreliance on MGD and cause a potential delay in transitioning toward a fully government-owned school feeding program.

Partnerships with the Private Sector

Private sector engagement in the implementation of MGD projects has the potential to mobilize financial and logistical resources to support the implementation of Sierra Leone's IHGSFP and reduce dependence on the government and foreign donors for financial resources. For example, a component of the recently launched NSFP indicates that "the delivery of school feeding services is through contractors." This policy strategy provides an opportunity for private sector engagement in the school feeding program. The use of private contractors could benefit the government because it allows for delayed payments for school meals and temporarily shifts financial responsibility for direct school meal provision to private sector actors.

Despite the government's creation of bold NSFP initiatives meant to engage the private sector in the implementation of Sierra Leone's school feeding program, this research effort found little evidence of private sector involvement in the MGD projects in Sierra Leone. The commodity transfer arrangement under the MGD program potentially limits private sector participation, especially in food procurement and supply, which is a significant component of each project's budget. Business opportunities that enable private sector participation in MGD are expected to improve with the launch of the LRP component. One area that could provide more private sector participation opportunities for under MGD is food fortification. Despite the limited number of organizations in the fortification industry, there is some evidence of private organizations already working in the food fortification sectors in Sierra Leone. A participant noted:

There are not many organizations in food fortification, but I believe there is at least Bennie Mix Company. They were doing some research around fortification.

A participant noted the process for food fortification in Sierra Leone:

Uhm, if you want to fortify food, you have to go through the Standard Bureau. You go through the Standard Bureau, and then the standard Bureau will walk with some related agencies based on the food they want to fortify, and then yeah, they can tell you exactly what I think the Standard Bureau is responsible for. It is the agency that will support the process of fortifying food; this is my opinion.

In general, private sector participation in MGD in Sierra Leone is limited despite the government's indication that private sector contractors are already providing school feeding services. Nonetheless, with the launch of the IHGSFP which emphasizes private sector engagement, and reliance on locally produced and processed nutritious foods, private sector participation is expected to improve. MGD in Sierra Leone could take steps to help government institutions build capacity to manage private sector engagement activities and relationships in the school feeding value chain. The addition of the LRP component will thus prioritize aligning with NFSP policy strategies and create business opportunities that enable private sector participation across the school feeding value chain.

Partnerships with the Nonprofit Sector

Sierra Leone's school feeding program space has multiple nonprofit organizations implementing school feeding interventions. Organizations including WFP, CRS, and Plan International, have ongoing school feeding interventions in Sierra Leone. There is a mixture of local and international nonprofits working with CRS on MGD projects. Evidence suggests that local organizations in Sierra Leone could play a significant part in the transition toward a HGSF program if given the needed support. For example, Teach for Sierra Leone is a local nonprofit supporting the implementation of gender-sensitive programming within the MGD program. Their efforts have led to an increase in the number of female teachers in some MGD target schools. A participant noted the impact of the local organization:

Teach for Sierra Leone helped "recruit all-female cohorts of over 100 fellows to work [schools] within those communities…and then we did another recruitment of mixed cohorts in which 60% of the successful candidates were also women."

Teach for Sierra Leone also organizes mentoring classes that target current female students who dropped out of school; "these classes often help older female dropouts grasp foundational educational skills while also providing a "safe place for them to regain the confidence of schooling again before they are reintroduced back into the formal education system."

Additionally, CRS working with Teach for Sierra Leone enabled the recruitment and training of university graduates as teachers in poor and deprived schools; this partnership directly resulted in an overall increase in the number of trained or certified teachers in MGD targeted schools.

There is evidence of CRS's partnership with other international nonprofits; for example, MGD's collaboration with CARE International facilitated the mobilization and distribution of "early grade literacy instructional materials" to reading clubs in MGD beneficiary schools. Under this collaboration, computer tablets and digital books were distributed to beneficiary

Table 1.14 Summary of Nonprofit Partnerships for School Feeding Under MGD Sierra Leone

PARTNER	CONTRIBUTIONS TO SCHOOL FEEDING
The Association of Language and Literacy Educators (TALLE)	They provide classroom-based coaching and supervision of teachers on literacy instruction in beneficiary schools.
Caritas, Sierra Leone	Caritas provides Life Skills Training and implements the WASH activities under MGD program project phases.
Helen Keller International	Helen Keller International supported deworming services in beneficiary schools.
United Nations Children Emergency Fund (UNICEF)	UNICEF provides learning and logistical support to school children. UNICEF also supports policy development on school feeding
International Literacy Association (ILA)	ILA provides in-service training in Diagnostic Teaching Methods (DTM) for teachers in beneficiary schools.
World Food Programme (WFP)	They implement school feeding in some parts of Sierra Leone.
Teach for Sierra Leoni	They support training and recruitment of teachers in rural areas to support teaching and learning in deprived communities.

pupils to aid in teaching and learning. CRS's partnership with CARE International increased the amount of available early grade literacy instructional material according to MGD project indicator on "improved early grade literacy instructional materials (include citation to a table here?) which demonstrates that CRS's partnership with nonprofits has generally been productive and mutually beneficial. Table 1.14 lists the MGD partnerships with the non-profit sector in Sierra Leone.

Community-Based Partnerships

Central to the NSFP is the critical role of community members; the policy emphasizes the meaningful involvement and participation of communities as a key strategy in the IHGSF program. The policy aims to leverage community production and enhance community ownership to support the implementation of the home-grown school feeding. The policy further prioritizes a decentralized national program, structured to link school feeding with smallholder farmers, the community, and the private sector.

"The launch of the NSFP and its emphasis on the use of school gardens, local procurement, private sector engagement, and local community participation in the implementation of the school feeding program provides a permitting environment for sustainability."

CRS prioritizes working with community organizations, and there is evidence suggesting that they work with mothers and other community members through MSGs and SILC. The school garden approach is another strategy used in the implementation of MGD projects to engage beneficiaries and foster partnership with community members; a participant noted:

Yes, people from the local communities are involved in working on the school gardens growing their own produce and supply in the school to be able to support the school feeding program; where we believe that is extremely helpful because it does not only provide high-quality organic food for the school feeding program is also helps to improve livelihood standards within those communities, and parents can also, families can also earn extra cash.

CRS's partnership with community organizations has been beneficial; it enabled the mobilization of local support and facilitated the formation of accountability structures in beneficiary communities. Community organizations have also been essential in disseminating health information at the community level. A study participant noted:

within the community. You know the mother support groups have been selected from each community that we are implementing our activities, so the mother support group is one of the key structures that we are using within the Communities with regards to health and nutrition.

Another a participant noted:

Community members provide an oversight, they monitor, they support, they coordinate, they advise, and they provide feedback at different levels.

Evidence from the interviews suggests that partnering with communities has yielded material support for school feeding as communities are willingly making material donations to support school feeding in their communities. A participant explained the working relationship between communities and CRS:

Yeah, I think as of now. We are working in partnership. Although we have not started LRP processes, they are also giving us their own little support because we provide the rice, lentils, and vegetable oil; they also provide the condiments. The locals provide salt, onions and pepper…. Without this provision, there would not be meals in any of our schools, so we are in partnership, very close, and everybody understands his own role and responsibility during this process. We provide ABC, and they provide DEF.

Despite the positive community response to MGD program's approach to school feeding, demanding material resources in the form of community contributions to the school feeding program could exclude vulnerable groups who can't afford the required contributions from the program and exacerbate the school dropout rate. Similarly, community contributions to the school feeding program are gendered. Community contributions often demand women-controlled resources such as food ingredients, fuelwood, and water. It is noteworthy to mention that demanding women-controlled resources as community contributions could deplete household resources and exacerbate household food insecurity.

Sustainability

The launch of the NSFP and its emphasis on the use of school gardens, local procurement, private sector engagement, and local community participation in the implementation of the school feeding program provides a permitting environment for sustainability. It is thus important that the LRP component is designed to align with current policy aims to enhance ownership and sustainability.

Community material contributions to the program, coupled with reports of financial expectations by project beneficiaries during training, suggest there is a need to sensitize communities and work to foster community ownership. For example, there are reports of community members expressing expectations of receiving financial incentives during trainings; this situation is exacerbated by the readiness of other nonprofit organizations working in the area to adhere to these financial demands. A participant noted their concerns regarding community financial expectations from the project.

Well, as I mentioned, we still face the handout syndrome, where project beneficiaries think that even though we are involved, let's also have some money, and you know the program has budgeted for specific things…..

The LRP component should prioritize creating economic opportunities that empower communities to gainfully participate in the school feeding program and reduce financial expectations from the project. Shaping the mindset of communities to own the project is key to overall the program sustainability.

Analysis of School Feeding Partnerships in Tanzania

Institutional Framework for School Feeding

Socio-economic and Policy Context

Tanzania is in East Africa and is made up of a large mainland area and multiple offshore islands including Zanzibar, Pemba, and Mafia. It has a recorded population (2020) of approximately 59,734,213 (World Bank, 2021). According to the World Bank, Tanzania has made great strides toward sustained growth and officially graduated from a low-income country to a lower-middle-income country in 2020. This growth reflects the country's macroeconomic stability and government commitments toward human capital development. Even though Tanzania has experienced improved economic stability, food insecurity continues to be a major problem. Data from the WFP suggests that nearly 20% of the population in 16 analyzed Tanzanian districts was estimated to be experiencing severe food insecurity (WFP, 2021). Further, food insecurity was found to be primarily driven by climate-based factors like prolonged dry spells, pest infestations, and erratic rainfall in the 2018 to 2019 growing/planting season. Additionally, malnutrition among children and women remains high in many areas. More specifically, households in rural areas were most impacted by malnutrition (Tanzania National Nutrition Survey, 2018). Moreover, Tanzanian children in poor households also tend to have disproportionately lower educational outcomes when compared to Tanzanian children in wealthier households.

Education has played an important role in Tanzania's economic growth and development. Education's role became especially apparent in 2014 with the introduction of the fee-free education policy by the Government of Tanzania. Since the introduction of this policy, primary school enrolment has increased and reached 99% in 2019 (WFP,2021). Additionally, most schools in Tanzania have achieved gender parity in enrollment rates. Even so, school-aged children from the poorest households were still far less likely to attend school in comparison to children from wealthy households. Further, tertiary level enrolment rates for children aged 14-17 years remain low (3%). Given the impact of the fee-free education policy and the need to address food insecurity amongst children, school feeding, and tangential policies, were created to increase enrollment rates amongst Tanzanian children and increase school-aged children's access to food.

School Feeding Policy Framework in Tanzania

Researchers conducted a review of Tanzanian policies that impact school feeding. The review yielded school-feeding-related policy documents published between 1973 and 2021. These policies were classified according to the Tanzanian government entity leading the policy effort. Given this classification scheme, policies were categorized into the following sectors (numbers inside squared brackets indicate the number of policy documents under the corresponding category): National Strategic Plans [8], this category includes intergovernmental organization country strategic plans, Education [5], Health and Nutrition and Early Childhood Development [7], Agriculture [2], and Trade and Food Safety [1]. From a preliminary review,

23 documents were identified as relevant for school feeding programming in Tanzania. While this review was thorough, this is not an exhaustive list of policies associated with school feeding programming in Tanzania. Nevertheless, this analysis will provide an overview of policies associated with school-feeding-related initiatives and projects that have or are occurring in Tanzania.

Sectoral Policies

National Strategic Plans

The Government of Tanzania released the Tanzania National Development Vision 2025 in 1999. Its primary focus was to improve the livelihood of Tanzanian citizens. In order to achieve its primary objectives of "achieving quality and good life for all", "good governance and the rule of law", and "building a strong and resilient economy that can effectively withstand global competition" it suggested the use of developmental strategies that include the establishment of universal primary education, the eradication of illiteracy, the attainment of a level of tertiary education, and training that is commensurate with a critical mass of high-quality human resources required to effectively respond to and master the development challenges that may hinder the implementation of the above objectives. Subsequently, in 2005, the National Strategy for Growth and Reduction of Poverty (NSGRP) was launched and continued to build on the primary goal of improving of quality of life and social well-being of all citizens. In the context of woman and child nutrition, this strategic plan had the goals of 1) ensuring equitable access to quality primary and secondary education for boys and girls, universal literacy among men and women, and expansion of higher, technical, and vocational education, and 2) improving the survival, health, and well-being of all children and women and vulnerable groups. These goals sought to impact child nutrition and education by creating strategies to enhance the implementation of school feeding programs, which included improving current school feeding programs as well as developing more of these programs with plans to target areas where individuals were experiencing the highest poverty rates, poorest education outcomes, and highest rates of household insecurity more generally (i.e., citizens living in poorer rural areas of Tanzania).

Following the release of the NSGRP, a basic agreement between the Government of Tanzania and the WFP was signed in 2006. The Agreement with the WFP helped the Government of Tanzania negotiate the terms under which they would receive assistance from the WFP which likely set the stage for future collaboration in the realm of development assistance to help with aspects such as the betterment of the education sector, childhood development, and other aspects of development both directly and indirectly related to school feeding. In 2010, the newest growth and poverty reduction strategy, the National Strategy for Growth and Reduction of Poverty II (NSGRP II), was launched with the same primary goal of improving quality of life and social well-being for Tanzanian citizens. Building on the objectives of the Tanzania National Development Vision 2025 and on the prior National Strategy for Growth and Reduction of Poverty strategic plan, the NSGRP II focused on increasing educational outcomes among citizens living in poorer, rural areas by allocating more resources to rural schools and children to increase school enrolment, school completion, and overall school performance. NSGRP II planned to increase school feeding program coverage meaning that more school feeding programs could feed more students and ideally all schools would eventually have school feeding programs wherein students would have access to school meals. Additionally, this plan includes a budget component under the Tanzanian Ministry of Finance and Economic Affairs and this ministry plans to implement measures aimed at enhancing capacity building in terms of coordination and budgeting for strategic plan objectives.

In 2010, the United Nations Development Assistance Plan, 2011-2015 was created and sought to achieve similar objectives associated with quality of life and well-being and the extension of more social services in accordance with MDG goal 2—universal primary education and MDG goal 3—promote gender equality and empower women. Additionally, national goals of 1) ensuring equitable access to quality education at all levels for males and females, and universal literacy for adults, both men and women, and 2) ensuring gender responsive and equitable access to quality education were included in this plan. Overall, this strategic plan led to a major school feeding outcome wherein the UN promised to work with the Ministry of Education and Vocational Training to establish a national school feeding program that prioritizes school feeding in food insecure areas of Tanzania with the eventual transfer of said program from joint ownership and implementation (with the WFP) to a completely government-owned and implemented national school

feeding program. Further, this plan included a budget line item meant to allocate funds to help the Government of Tanzania with school feeding implementation, school feeding capacity building, and with technical assistance to develop their own implementation strategies and guidelines for national school feeding.

In 2016 the National Five-Year Development Plan, 2016-2020, was launched. This plan set the stage for the implementation of other plans and initiatives such as the comprehensive plan for free education which would allow children to attend primary and secondary school without having to provide tuition-like payment. It also focused on sector-specific interventions associated with schools and school feeding programs and plans—like the school milk program and plans to increase rural school infrastructure (i.e., water, electricity, and health services, teacher training, and school curriculum improvement).

In 2016, the second UN development assistance plan, the United Nations Development Assistance Plan, 2016-2021 (UNDAP II), was created and mainly sought to achieve outcomes associated with increasing the coverage of nutrition services and access to safe and affordable water for women, children, and vulnerable populations. Lastly, in 2017, the WFP: Tanzania Country Strategic Plan (2017-2021) was initiated and used lessons learned from the WFP implemented home-grown school feeding program pilot (budgeted for in the UN's United Nations Development Assistance Plan, 2011-2015) to share school feeding best practices with the Government of Tanzania. Additionally, the WFP agreed to provide future support at the government's request with the eventual goal being a Tanzanian-owned and operated national school feeding program.

Education Policies

School feeding programs primarily focus on education-related activities; school meal programs are usually used as a method to enhance educational outcomes. In Tanzania, the earliest education policy that discusses school feeding is the 2001 Primary Education Development Plan (2002-2006). This plan mainly focused on financing school feeding. Essentially, this plan concluded that school feeding resources carried a large cost pushing the Government of Tanzania to continue to negotiate for higher financial contributions from donor communities to cover these costs. Additionally, at the community level, school feeding programs were expected to heavily rely on voluntary contributions from their respective communities for things like food provision and other school feeding materials. In 2004, the Secondary Education Development Program was created with specific educational objectives in mind. Most notably, one objective sought to maximize time-on-tasks and provide incentives for students to learn in hopes of increasing educational outcomes. To achieve those educational objectives, this program utilized a school feeding strategy that established that schools would provide lunch using capitation grants and parental contributions with plans that all-day schools provide school lunch for students by the year 2005. In 2010, a tangential program, the Secondary Education Development Plan 2010-2015 II, proposed to establish special feeding programs that would allow students and school personnel affected by HIV and AIDS and those suffering from these infections to receive school meals; it pushed to have these special feeding programs in place in secondary schools by 2010. In 2012, the Primary Education Development Programme III (2012-2016) launched and sought to increase access and equity at the pre-primary education level by using proposed strategies such as mobilizing community support to sustain school feeding programs for pre-primary children and eventually scaling up school feeding programs to the national level so that all primary schools had school feeding. With the help of Project Concern International (PCI), leveraging the MGD Program and the WFP, Tanzania finally launched its First National School Feeding Guidelines in November 2021 which is a giant step toward the establishment of its own national school feeding program.

Health and Nutrition and Early Childhood Development Policies

In 1992, the Food and Nutrition Policy for Tanzania, under the Ministry of Health, was launched. It focused on school-age children between ages seven and 14 years old and mainly sought to avoid malnutrition among this population. It proposed that providing nutritious meals at school may enhance student learning, given that most children did not eat breakfast before attending school and schools did not provide healthy lunches. To avoid learning difficulties and health problems associated with child undernutrition, this policy proposed that: [1] Parents and guardians should be educated on the importance of providing children with food before leaving for school.

[2] Efforts to provide school children with proper lunch should be enhanced and strengthened. [3] The Health and Nutrition Programme in schools should be expanded in scope and improved. [4] There should be a follow-up to ensure that improper foods are not sold in school compounds. By 1996, the Child Development Policy was launched to promote child survival using strategies such as 1) mobilizing and educating children, parents, and the community on good nutrition, adequacy of food intake, and preparation of various types of food; 2) increasing the production, preservation, and proper utilization of food crops, and increasing the production of cash crops; 3) encouraging and educating parents and communities on breastfeeding and appropriate weaning foods for children under five; and 4) educating communities on environmental sanitation and mobilizing communities to construct and utilize improved latrines. These policies set the stage for more health and nutrition policies associated with school feeding.

In 2005, the Tanzania Food and Nutrition Centre Strategic Plan provided services to communities such as community awareness-raising interventions and the provision of skills to manage school feeding. This center also reviewed the current manuals on the management of school feeding programs. In 2008 the Zanzibar Food Security and Nutrition Policy was drafted to fulfill the objective of strengthening social protection and safety nets needed for vulnerable groups, mainly working with the Ministry of Education and Vocational Training (MoEVT). This meant establishing public assistance programs that included school feeding, school gardens and gardening programs, and home rationing and supplementary feeding programs to reduce malnutrition and related illnesses. The MoEVT was primarily responsible for ensuring that school feeding and gardening activities were effectively coordinated as these programs became a vital part of the social safety net established to address child malnutrition in Tanzania. The National Nutrition Strategy July 2011/12 - June 2015/16 established policy trends for nutrition interventions in national and sectoral policies and plans. This policy's key objective associated with school feeding established the trend for all government development policies to adequately incorporate nutrition as a priority area for achieving economic growth, stability, and prosperity. As a result, nutrition interventions were mainstreamed into national and sectoral policies, plans, and programs.

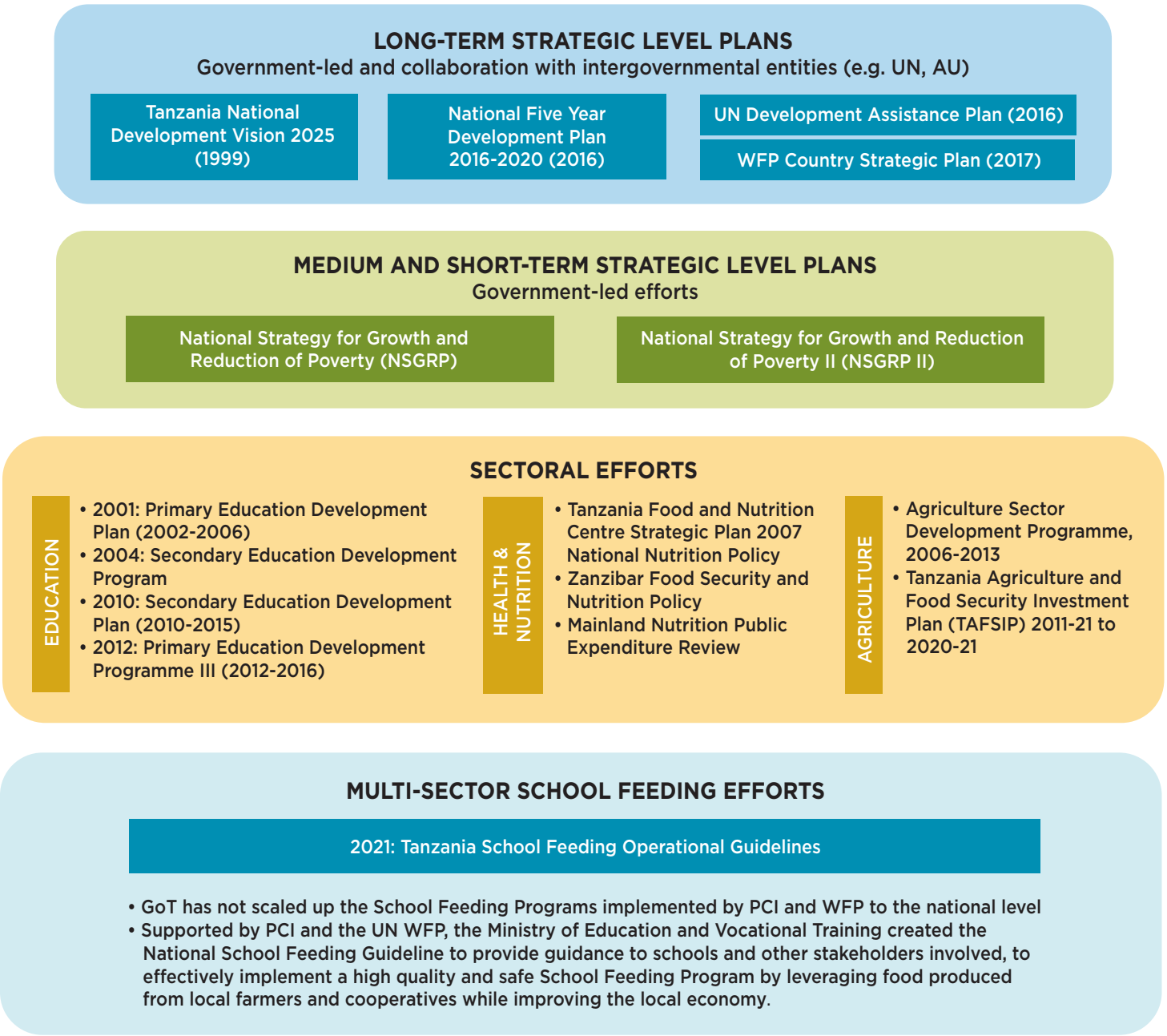
The National Multisectoral Nutrition Action Plan (NMNAP) of 2016, following on the heels of the National Nutrition Strategy, included nutrition interventions with priority areas that included: scaling up multisectoral nutrition-sensitive interventions (agriculture and food security; health and HIV; WASH); education; social protection; and environment and climate change). Additionally, its key outputs include: 1) Communities have access to a diverse range of nutritious foods throughout the year; 2). Communities regularly use quality maternal health, family planning prevention services, treatment of HIV and malaria communities, and schools' access to adequate WASH services. 3) Girls complete primary and secondary education; 4) Poorest households benefit from TASAF conditional cash transfers, cash for work, and nutrition education during the community sessions; and 5) vulnerable communities are able to cope with drought and climate change to avoid shortages of nutritious food during shocks. These outputs went a long way to highlight the need for key school feeding infrastructure that also often reflected their respective community's infrastructural needs. Finally, the Mainland Nutrition Public Expenditure Review was created in 2018 with explicit strategies to analyze current government spending and make recommendations to establish, sustain, and implement early childhood education and development programs and policies, along with school feeding policies, and school capacity and infrastructure policies associated with WASH, nutrition, health education programs.

Agriculture and Trade and Food Safety Policies

In 2003, the Tanzania Food, Drugs and Cosmetics Act of 2003 established the Tanzania Food and Drugs Authority (TFDA) which works to govern food importation through regulation of food safety, quality, and effectiveness. In 2006, the Agricultural Sector Development Programme, 2006-2013 was released; it emphasized the need to create social safety nets for poorer citizens. Therefore, this program facilitated social safety nets with support from the WFP and the Tanzania Social Action Fund to complement current District Agricultural Development Plans that were based in food insecure communities (e.g., school feeding, food for work, cash for work, etc.). Lastly, in 2011, the Tanzania Agriculture and Food Security Investment Plan (TAFSIP) 2011-21 to 2020-21 was created to attend to food security; its

main objective, associated with school feeding, was to enhance household and nutritional food and nutrition security. To achieve this objective, this plan stated that a national school feeding program would be supported to improve food intake and improve school attendance among primary students in Tanzania. This plan proposed to improve school feeding policy by reviewing available policies and then incorporating education reform and lessons learned from educational program issues associated with current primary school feeding.

Figure 1.17 Tanzania — Policy Framework for School Feeding Programming



Source: Authors

School Feeding Policies: Cross-sectorial and cross-level collaborations

The Ministry of Education, Science and Technology approved the National School Feeding Guidelines in March 2021 and continues to work toward creating a national school feeding policy. As demonstrated by tracing the above sectoral policies associated with school feeding, a large number of plans, strategies, and programs have been introduced. With the help of a pilot HGSF program executed by the WFP, a set of school feeding best practices was also identified. Similarly, the PCI-led MGD school feeding program has, since its beginning in 2010, contributed to forming and informing school feeding practices. Even so, Tanzania has made little progress toward establishing and maintaining a government-owned and led national school feeding program, though many localized HGSF programs exist.

"[…] in 2011, the Tanzania Agriculture and Food Security Investment Plan (TAFSIP) 2011-21 […] stated that a national school feeding program would be supported to improve food intake and improve school attendance among primary students in Tanzania."

As the 2001 Primary Education Development Plan (2002-2006) stated, most funding for school feeding comes from donors, and programs are expected to mainly function using community contributions and community-level management. Prior research suggests that placing the functioning of school feeding in the hands of their respective local communities may be indicative of a larger issue. More specifically, for Tanzania to establish a national school feeding policy, its current HGSF model must be expanded to include more participation from the central government. In essence, efforts that include the provision of land and water by the government to increase food production are necessary. Similarly, the value chain needs to include more participation from multiple stakeholders, preferably more from the private sector. Further, the Government of Tanzania could take action to make participation in school feeding mandatory so that students in non-private schools, normally located in poorer areas, also benefit from school feeding like their private school counterparts. Lastly, the WFP's and PCI's best practices and implementation strategies should be used to develop a national school feeding policy that ensures school feeding programs receive funding from the Government of Tanzania so that the burden does not solely fall on community members and parents, and ultimately households that already suffer from food insecurity themselves. Lastly, policy development should occur in a multisectoral manner with clear delegations of fiscal and other responsibilities to ensure that resources for school feeding at the national level come from a variety of ministries, each with their own earmarked set of responsibilities and goals associated with school feeding (Roothaert et al., 2021).

McGovern-Dole Food for Education Program implementation in Tanzania

Donor-led School Feeding Efforts in Tanzania

Poverty rates among the rural population in Tanzania are especially high, resulting in child malnutrition (See the above section labeled Socio-economic context for school feeding in Tanzania). Because of these poor nutritional outcomes, school feeding, in some form or another, has been present in Tanzania for many years (Lukindo, 2018). Nevertheless, many early attempts at school feeding were eventually abandoned. It was not until the early 1980s that commitment to school feeding really took hold, with the establishment of community-supported school feeding programs in the Dodoma and Singida regions of Tanzania. Even so, school feeding was not widespread or well-implemented. In 2000, the WFP began implementing school feeding programs in the Dodoma, Arusha, and Singida regions of Tanzania, and this laid the groundwork for other school feeding programs in the country. While the WFP continues to implement school feeding in some parts of Tanzania, by 2010, other non-governmental organizations—mainly PCI—began implementing school feeding programs funded by USDA-FAS. While PCI's implementation role began in 2010, this non-profit's presence in Tanzania did not begin with its relationship with USDA.

PCI's Tanzanian branch began working in Tanzania as early as 2008 on a separately funded water and sanitation improvement project. Working with local Tanzanian government officials and communities, PCI began implementing MGD projects in 2010. Phase 1 began at schools in Musoma Rural, Butiama, and Bunda districts in the Mara region of Tanzania. With funding from the USDA, PCI has gone on to implement two more project phases of the MGD school feeding program (Phase 2 from 2013 to 2016 and the current Phase 3 from 2016 to 2021) and has simultaneously implemented an LRP component called Chakula Chetu (2017-2020). The multiple project phases reflect efforts not only to provide school meals, but also to implement a comprehensive approach to school feeding that includes work in the areas of education, nutrition, school WASH, health, and value chain/supply.

MGD programmatic changes across different phases

The MGD school feeding program provides school meals to children attending pre-school and primary school as an intermediate goal which is intended to improve literacy outcomes. The provision of school meals is a mechanism through which program projects can improve school enrollment, attendance, and student attentiveness. Each phase includes strategic and geographic programmatic modifications to increase the sustainability and capacity of the school feeding program in each targeted school, expecting that the government and communities of Tanzania will eventually have primary responsibility for school feeding in their country. Phase 1 began by targeting 103 schools for school feeding project implementation in the Bunda and Musoma Rural districts in the Mara Region of Tanzania. Phase 1 emphasized the provision of school meals while also incorporating nutrition, health, and WASH efforts. During the initial phase, school meal commodities and resources were completely provided by the USDA's in-kind contributions. Students at targeted schools received one morning snack and one meal for lunch each day of the school week. In terms of the education component, Phase 1 mainly focused on food provision in efforts to encourage attendance and the pursuit of gaining an education more generally. WASH programs were also introduced during this time which allowed for the construction of latrines and teachings about sanitation and water safety.

Phase 2's project saw an expansion in the coverage of the program, an increased focus on education, and an emphasis on school feeding sustainability and capacity building. Program objectives were solidified and focused on improving literacy through the provision of school meals which would then help increase student attendance, enrollment, and attentiveness. Additionally, a parallel

component, the LRP component, began in 2017 as an effort to increase school feeding program sustainability in 16 primary schools through funds dedicated to developing local capacities for local procurement of school meal commodities and resources. Phase 2 also saw the addition of 31 schools and the expansion of the program into the Butiama district. This resulted in the inclusion of 134 schools in three districts into the program. Because of large increases in enrollment, some schools were split into A and B schools, which resulted in 156 schools overall. In terms of commodity supply, most commodities for school meals were still supplied by the USDA. Students were still fed five days per week, but instead of one snack and one meal, students were provided with two school meals per day. Porridge was provided for breakfast and rice, beans, and oil for lunch. By Phase 3, MGD and PCI began focusing on handing over the school feeding program to Tanzania and the target communities.

Over the course of Phase 3, MGD decreased its contributions to the school meal program overall in effort to "graduate" or eventually hand over the ownership and responsibility of the school feeding program. Now active in 231 schools, MGD began decreasing its contributions to beneficiary schools. Decreasing contributions allowed the local communities to increase their contributions of time, goods, and funds to their respective community school feeding programs. Eventually, MGD/USDA began only supplying food for school meals for three days per week, allowing the communities to contribute food and resources to feed school children for two days per week, which was a practice in building program sustainability in communities and schools. Conversion to a complete LRP/community-supported school meal program in the 16 beneficiary schools was aided by the LRP component. This began with the LRP component providing 50% of food for school meals for two days per week, with the ultimate outcome being those schools no longer depending on food from USDA in-kind commodity contributions. Many other activities and achievements also occurred during Phase 3.

Phase 3 also included important changes in the other school feeding components. Further project changes included the introduction of new rainwater harvesting methods utilizing rainwater harvesting tanks, which helped provide water during dry seasons to the targeted schools. This phase also brought the introduction of the HGSF framework, introduced, and supported by the WFP, which cemented a working partnership between the WFP with PCI. The HGSF model emphasized the establishment of a Tanzanian-owned school feeding program fueled by a local supply chain. HGSF emphasized the idea that school-feeding commodities would eventually be provided because of strong partnerships with local actors, producers, and processors (i.e., smallholder farmers, local processors, and traders, and via government funding). By November 2019, school-feeding meals in most beneficiary schools were no longer supported by USDA-provided commodities, and each school's community fully provided food for their respective school meal program. By January 2020, target schools were successfully implementing their community-led school feeding models and were self-reliant in terms of school feeding food provision and resources. As of September 2021, some communities have contributed around 1,652 metric tons of rice and beans for their school feeding programs. Phase 3 also included activities that increased sustainability and capacity of school feeding; these activities include Savings and Internal Lending Communities (SILC) programs which allowed mothers of students to help fund school feeding in their schools, and the creation of a new, more sustainable water collection system (i.e., the borehole system). The borehole system collected groundwater used to supply water to schools, and it allowed schools to make money through the sale of water. This phase also saw the establishment of school gardens in several beneficiary schools, which have the dual purpose of supplementing school meals and teaching students how to grow their own food. Given the significant changes and the overall evolution of the MGD school feeding program projects, major school feeding outcomes and achievements can be observed among beneficiaries.

MGD Programmatic Components and Outcomes in Tanzania

MGD school feeding efforts are a set of programmatic and comprehensive activities seeking to mainly improve literacy of school-aged children and nutrition, health, and dietary practices among program participants. Activity categories include education and literacy, nutrition and health, WASH/SWASH, and with the introduction of the LRP programmatic effort, supply chain activities.

Education and Literacy

The education component seeks to improve student literacy more broadly, which includes improvements in reading and writing. MGD indicator #1, "Percent

of students who, by the end of two grades of primary schooling, demonstrate that they can read and understand the meaning of grade level text", measures these improvements. This indicator shows an approximate four percent increase in student literacy among MGD program project beneficiaries between FY 2017 to FY 2019 in Phase 3 (see Table A in appendix 1.3). Student literacy was measured using the Early Grade Reading Activity (EGRA) tool. To improve literacy, the program also includes subareas of focus like student classroom attentiveness, school attendance, and literacy education quality. Activities used to improve classroom attentiveness include reducing short-term hunger via increased access to food. This aspect of education is partially achieved by providing school meals to students and by campaigns to emphasize the importance of receiving an education. Phase 3 data reveals that school-aged children are receiving school meals throughout Phase 3. Additionally, indicator data show that average student attendance in McGovern-Dole supported schools and programs has increased over time (see Table A in appendix 1.3).

One activity that targets quality of education is the provision of reward incentives given to those instructors that get nominated as "best teacher" which helped improve teacher attendance. Teachers also received training to learn more effective teaching techniques. Additionally, school administrators, education officers, school committee members, and head teachers received training on school management and leadership. Schools were also supplied with updated school supplies and instructional materials for their classrooms. New libraries were built and stocked with appropriate reading and learning materials. The indicator data show that these activities occurred in targeted schools, especially in Phase 3 of project implementation. PCI staff observed that the addition of school infrastructure, mostly libraries, has not only increased student awareness of the utility of and engagement in educational activities, but also influenced community members to utilize educational infrastructure and resources. One PCI staff member closely involved with the educational components of MGD noted, "We have gone far as being the first NGO in Tanzania to construct libraries. Up to now we have ten (10) libraries that are being used by other people outside to come and learn how the library works." (Interview with country-level key informant, November 2021)

Nutrition and Health

To improve student attendance, efforts to reduce health-related absences, improve school infrastructure, and increase student enrollment were undertaken. The second component, nutrition and health included activities meant to increase the use of health, nutrition, and dietary practices; students, teachers, administrators, and community members were included in the trainings. Project implementers taught proper dietary and nutrition practices to students and teachers, who then spread those practices to their communities by establishing school clubs where students could teach their parents and other community members the information they learned in school. For example, students readily engage in student health clubs where they meet outside of school to learn even more about health and nutrition and "share the knowledge with their fellow students and community members." (Interview with country-level key informant, November 2021). Additionally, student health screenings occurred approximately twice a year, and government and implementing partners dewormed students. Relevant indicator data show that needed training in child health and nutrition took place because of the MGD project (see Table B in appendix 1.3). Training and the subsequent spreading of nutrition and health knowledge played a key part in the success of the nutrition campaigns created to impart the importance of good nutrition and healthy dietary practices upon students and their communities.

WASH

The WASH project component improved student and school personnel's knowledge about health and hygiene practices; increased access to clean water and sanitation; and improved food preparation, handling, storage, and cooking practices. WASH activities consisted of constructing new latrines and other gendered WASH facilities. Both students and teachers were trained on how to operate these facilities. Further, water harvesting systems—borehole groundwater systems and rainwater harvesting tanks—provided schools with access to freshwater. The project also established school water committees. Students were taught proper handwashing techniques using their new WASH facilities. WASH programs also taught school cooks how to properly handle, store, and wash foods using hygienic practices; lastly, this component included training on commodity management and school meal preparation. Performance

data in Table B (see appendix 1.3) show that more schools have improved water sources and sanitary facilities over the course of Phase 3 implementation.

Overall, the MGD school feeding program projects have provided many resources to targeted schools in Tanzania through the education, nutrition and health, and WASH project components. Some additional components include the gender component and agricultural activities associated with establishing school meal local procurement strategies and commodity production. For example, the gender component not only focused on creating a more inclusive learning environment for students but also meant that more teachers were female. Equal attention and efforts were made to maintain girls' school enrollment, retention, and completion rates. Further, gendered programming in the WASH component allowed for the construction of menstrual management rooms for female menstruating students and the addition of urinals for male students. Women empowerment groups were also established. These groups allowed mothers and other women in school feeding communities to join SILC, which allowed women in targeted school feeding communities to make money at the household level (through business, farming, etc.). This subsequently allowed them to contribute food, money, and other resources to their respective school feeding programs. Performance data in Table C (available in appendix 1.3) shows that a large percentage of parents utilize these SILC groups, and overall parental participation in these groups has grown over the course of Phase 3 implementation. As for the supply chain component, most activities were associated with the LRP component, which mainly focuses on establishing partnerships and methods to provide food for school meals using local and regional procurement.

Supply Chain

Many of the activities associated with the supply chain and LRP components included agricultural activities that helped provide food for school feeding programs and for their respective communities and households. For example, schoolchildren learn how to grow gardens, and school gardens not only taught agricultural techniques to students but also provided food that supplemented the food already used in their school feeding programs. Performance data in Table C (available in the appendix 1.3) also supports the use of school gardens, as they have produced a lot of commodities for project schools over the course of the most current project phase. School gardens also taught students to grow their own home gardens, which helped students create a food source to supplement their meals at home and make money for their households. These school feeding programs also established demonstration plots (demonstration gardens) to both provide local farmers with access to arable land and teach them modern farming techniques. These plots were also used to teach project beneficiaries, such as women in established women empowerment groups, agricultural techniques. Lastly, seeds were provided to schools and communities to produce food products and harvest them to give to schools to support school feeding and their households. These activities also afforded individual farms, group farms, and group farm unions the ability to contribute to food production in schools. Program project components have resulted in many achievements associated with school feeding. Nevertheless, these achievements could not have occurred without the creation of important partnerships that helped with the implementation of the many program project components. The success of the MGD program is closely tied to the effectiveness of project component implementation. Even so, implementation could not occur without the creation and facilitation of the many, hopefully sustainable, multisectoral partnerships.

Partnerships for School Feeding in Tanzania: The role of MGD

The success of the MGD program is closely tied to the effectiveness of project component implementation. Even so, implementation could not occur without the creation and facilitation of the many, hopefully sustainable, multisectoral partnerships.

Partnerships with the Public Sector

Public partnerships in the Tanzanian MGD Food for Education school feeding program mainly included partnerships between PCI and central government agencies. A summary of key partnerships with the public sector in Tanzania is available in Table 1.15 below. These include partnerships between PCI and the Rural Water Supply and Sanitation Agency (RUWASA), the Ministry of Education and Vocational Training (MoEVT), Ministry of Health, Community Development, The Elderly, Gender, and Children (MOH), Ministry of Agriculture (MINAGRI), Tanzania Institute of Education, Tanzania Food and Nutrition Center (TFNC), Regional Consultative Committee, Tanzania Food and Drugs Authority, Tanzania Medicine and Medical Devices Authority, Office of the President Regional Administration and Local Government (TAMISEMI), Small Industries Development Organization (SIDO), Ministry of Finance and Planning, and the Tanzania Agriculture Research Institute (TARI). These government agencies contributed a variety of resources to the school feeding program. RUWASA played a vital role in the development of a sustainable solution for harvesting water subsequently used in WASH facilities. This agency aided PCI in developing its borehole system to gather groundwater. They successfully constructed 18 borehole systems and used them, in conjunction with their rainwater harvesting tanks, to provide a sustainable source of water for school feeding programs year-round.

The Ministries of Education and Health provided school feeding programs with a variety of sources. For example, the Ministry of Education played an integral role in the implementation of education related components. Both ministries helped with teacher trainings by providing training personnel and supervision in the form of education officers to make sure that the elements of teacher trainings aligned with government expectations. The Tanzanian Institute of Education, an organization housed within the Ministry of Education, provided the materials for these teacher trainings. These agencies also provided extension workers and ward educational officers to help PCI with data collection and component monitoring. In return, PCI provided resources to the Ministry of Health in the form of funding and staffing. An example of this is when PCI provided funding to the Ministry of Education so that they could hold a National Educational Symposium Forum. Additionally, district government officials associated with the Ministry of Education are paid using MGD funds to help with the general implementation of school feeding.

Further, PCI provided technical support to the Office of the President Regional Administration and Local Government (TAMISEMI) and to the Ministries of Education and of Health to draft their National School Feeding Guidelines. The TFNC helped draft the accompanying National School Feeding manuals that would be used to implement school feeding programs around the nation. Finally, PCI helped the Government of Tanzania establish their Regional Consultative Committee, whose primary focus is to help sustain current and future school feeding activities by helping establish and implement district-level school feeding budgets.

The Ministries of Agriculture and of Health used their partnership with PCI to provide personnel to help perform the baseline assessment that influenced the first draft of the current Tanzanian National School Feeding Guidelines. Additionally, PCI has a partnership with the Ministry of Finance wherein the ministry helps solve any importation and tax issues associated with importation of school feeding commodities. In terms of agricultural and food-related partnerships, PCI works with the Tanzania Bureau of Standards to ensure that all foods that require fortification are fortified before they are sent to

Table 1.15 Summary of public partnerships for school feeding under MGD Tanzania

PARTNER	CONTRIBUTIONS TO SCHOOL FEEDING
Rural Water Supply and Sanitation Agency (RUWASA)	RUWASA helped PCI establish the bore hole system as a part of WASH infra-structure like latrines, wells, and sanitation systems.
Ministry of Education and Vocational Training	The MoEVT help PCI perform teacher training, implement elements of school feeding, and aid in developing national school feeding guidelines.
Ministry of Health, Community Development, The Elderly, Gender, and Children	They help PCI implement elements of school feeding, and aid in developing national school feeding guidelines.
Minister of Agriculture	The MInister of Agriculture helps PCI implement elements of school feeding, and aid in developing national school feeding guidelines.
Tanzania Institute of Education	This institute helps PCI perform teacher training by providing training materials.
Tanzania Food and Nutrition Center	TFNC helps sustain McGovern-Dole school activities by helping create school feeding nutritional manuals.
Regional Consultative Committee	This committee helps sustain McGovern-Dole school feeding activities by helping establish and implement district-level school feeding budgets.
Tanzania Food and Drugs Authority	They provide quality assurance feedback on USDA and locally procured foods before they are sent to MGD schools.
Tanzania Medicine and Medical Devices Authority	They provide quality assurance feedback on USDA and locally procured foods before they are sent to MGD schools.
Office of the President Regional Administration and Local Government (TAMISEMI)	TAMISEMI helps implement key school feeding elements in MGD schools and to aid in the development of national school feeding guidelines.
Small Industries Development Organization (SIDO)	SIDO helps PCI implement elements of the school feeding program such as helping train women on how to produce reusable sanitary pads and train farmer groups on how to process and package food.
Ministry of Finance and Planning	The Ministry of Finance and Planning helps solve importation and tax issues associated with importing food for the school feeding program.
Tanzania Agriculture Research Institute (TARI)	TARI provides beans to be used in school gardens.

Source: Partnerships Assessment Tool developed by authors from MGD documentation and interviews with key informants

school feeding programs. Moreover, the Tanzania Food and Drugs Authority, Tanzania Medicine and Medical Devices Authority, Tanzania Atomic Energy, Ministry of Agriculture, and the Tanzania Revenue Authority all work together to perform quality assurance checks on food imports before USDA food commodities are sent to schools from storage warehouses. The SIDO is a government organization that works with PCI to train women on how to produce reusable sanitary pads, and train farmer groups on how to construct sunflower refinery machines as well how to process and package food following government standards; this organization was likely involved in building eight sunflower oil processing factories in council areas near the targeted communities. The TARI, a semi-autonomous body under the Ministry of Agriculture, works with PCI to provide the school feeding programs with beans that were then distributed to ten schools for their school garden plots; after harvesting, these beans were then distributed to other schools.

The relationships between Tanzanian government agencies and organizations and PCI provided a great deal of resources that helped implement school feeding. These resources included technical support, personnel, transportation, food processing infrastructure, and services that helped with program oversight and food quality. These resources, especially those flowing from the government to school feeding programs, helped lead to the sustainability of school feeding in Tanzania by ultimately placing the ownership and responsibility

of school feeding in the hands of the Government of Tanzania. Further, partnerships with public entities, like the Ministries of Education, Health, and Agriculture, resulted in the creation of a national school feeding policy that can be utilized by all school feeding programs in Tanzania. Unfortunately, opportunities for partnerships between Tanzanian ministries and private companies (public-private partnerships) seemed scarce or nonexistent according to many of those involved in school feeding implementation.

Further, many school-feeding implementers expressed concerns over whether the government would adequately budget to establish long-term program sustainability. For example, some PCI staff mentioned the MGD funds are used to pay government officials for their participation in school feeding activities, but when there are no funds for these payments, those officials are not involved in school feeding. After the MGD hands the project over to Tanzania, the ministries and upper-level governing bodies will be responsible for paying government officials in the context of school feeding. Many individuals working for PCI suggested that a community-led school feeding program be scaled up and used in all schools, but they often expressed some doubt in terms of program sustainability, given that sustainability depended on the government's willingness to continuously fund school feeding.

Partnerships with the Private Sector

Private partnerships are believed to be the driving force in fortification in many USDA-FAS MGD Food for Education school feeding program target countries. Nevertheless, Tanzania's MGD effort has limited partnerships with the local private sector. Many PCI staff have observed that there is a lack of private partnerships associated with school feeding. Some members of PCI recommended more private companies be involved with school feeding, given that partnerships with private companies are viewed as greatly contributing to program sustainability in ways the government alone cannot. For example, some PCI staff expressed that Tanzanian government agencies halted the importation of the MGD commodities. Through interviews with some PCI staff members, we found most staff involved in implementation observed the Tanzanian government did not ensure local procurement could fill the void their actions created. Moreover, although private companies have the capacity to carry out fortification processes following government dictated standards, most school feeding programs lacked the necessary private sector partnerships to ensure they would be able to access fortified foods used to prepare school meals. Those school feeding programs that mentioned having private sector partnerships often found these partnerships were difficult to establish and were not sustainable over time. Recommendations for improvement often insisted more local organizations become subgrantees to increase the capacity of local communities to process and distribute local commodities to support school feeding.

Therefore, access to fortified goods for the preparation of school meals is something that most MGD schools cannot accomplish alone, but there is a need to expand collaboration with the private sector to include fortification in school meals, which in turn, have to follow government regulations in the subject matter Working in tandem with NGOs, most fortification seems to be performed by organizations like Sanku (not an affiliate of MGD-PCI), a partner of the Government of Tanzania. Even so, these partnerships do not seem sustainable, and many of those implementing the MGD school feeding program projects believe that fortification should be performed by private companies to create a competitive market wherein these companies could compete for school feeding contracts, resulting in the best performing private companies receiving school feeding contracts. In a scenario that assumes multi-sector engagement in fortification, central governments would have the role of designing the regulatory framework, the private sector would be responsible for the fortification process, and communities, including schools, would have a larger role in enforcement. However, a larger-scale, centralized process of fortification is a more effective way to ensure quality assurance. Nevertheless, there are other areas where communities could be more engaged in the value chain process, especially in areas of smallholder capacity building, including areas that may impact fortification.

Partnerships with the Non-profit Sector

Non-profit partnerships in the Tanzanian MGD program projects mainly included partnerships between PCI and other non-profit organizations like the Convoy

of Hope, School to School International, the World Food Programme, Nutrition International, UNICEF, Save the Children, and FAO (Table 1.16). One of these organizations, the WFP, also implements USDA/FAS MGD school feeding programs in other countries as well. Cases from Kenya and Rwanda are highlighted in this report. These non-profit organizations contributed to the school feeding programs in Tanzania by helping with component implementation, development of National School Feeding Guidelines and related manuals, and provision of education, teaching, and training materials. The Arusha Convoy of Hope helped with general education and meal provision. School to School International was essential to the organization of teacher training and training teachers on how to use decodable books that helped students learn words and sentences; this was done in collaboration with local universities and the Ministry of Education. The WFP, Nutrition International, UNICEF, Save the Children, and FAO all assisted PCI in implementing some school feeding components and with the development and validation of the National School Feeding Guidelines using data from a survey collected by PCI.

The relationships between these non-profit organizations and PCI provided a great deal of resources that aided in the implementation of school feeding education components and with the drafting national school feeding policy. These resources likely include technical assistance and support in the form of personnel. These resources flow from non-profit to non-profit (i.e., between PCI and these organizations). These non-profit organizations partner with Tanzanian school feeding programs, including their involvement with teacher training and policy drafting, and have aided in school feeding program sustainability. This was accomplished by each organization's focus on increasing the capacity of teachers to both teach students and manage their classrooms. Additionally, these organizations helped the Tanzanian government establish policies that would allow the best practices learned from the MGD school feeding program to be scaled up and eventually used in all school feeding programs in Tanzania. While PCI and the listed non-profit organizations tend to work closely together on a variety of parallel implementations of differing school feeding and education programs in Tanzania, most possible partnerships already exist and likely do not need to be supplemented. Further, most of these non-profits, including PCI, already work closely with the Tanzanian government at the central, district, and regional level, as well as, at the community level. There does not seem to be any difficulty establishing and maintaining

Table 1.16 Summary of Partnerships With the Nonprofit Sector for School Feeding Under MGD Tanzania

PARTNER	CONTRIBUTIONS TO SCHOOL FEEDING
Convoy of Hope (Arusha)	They help implement and sustain McGovern-Dole school feeding activities.
School to School International	This organization helps increase the use of modern teaching methods in Tanzanian classrooms by training teachers on how to use updated teaching materials (decodable books).
World Food Programme	The WFP helps PCI implement elements of school feeding, and aid in developing national school feeding guidelines.
Nutrition International	They help PCI implement elements of school feeding, and aid in developing national school feeding guidelines.
UNICEF	UNICEF helps PCI implement elements of school feeding, and aid in developing national school feeding guidelines.
Save the Children	They help PCI implement elements of school feeding, and aid in developing national school feeding guidelines.
FAO	FAO helps PCI implement elements of school feeding, and aid in developing national school feeding guidelines.

Source: Partnerships Assessment Tool developed by authors from MGD documentation and interviews with key informants

non-profit relationships within Tanzania, except in the case that some programs occur in different parts of Tanzania, and therefore do not cross paths or implement their programs within the same geographic areas.

Community-Based Partnerships

Community and Research and Development partnerships in the Tanzanian MGD program mainly included partnerships between PCI and community-level groups, as well as between PCI and Tanzanian research universities. These include partnerships between PCI and Education Cascade Groups, the Government Parent Teacher Association, school committees, and women empowerment groups (Table 1.17). In terms of research and development, relationships were primarily with universities with research and development programs, like the National Institute of Transport. These community groups and universities contributed a variety of resources to the school feeding program in Tanzania. For example, the Government Parent Teacher Association meets and works with community members to draft an annual plan detailing how to implement key school feeding components. This may include plans for how food will be sourced, procured, or handled, and how much the community is expected to contribute to school feeding each year. School committees also provide their community school feeding programs with organizational strategies for school feeding programs. These organizational strategies include mobilization of communities in efforts to get community contributions to school feeding. This sometimes includes resources in the form of materials like sand, stones, labor, and water to help build school buildings and other capacity building. Further, these committees include teachers and other school administrators as well as parents. Everyone donates labor to build school feeding capacity, like the construction of sunflower processing machines. These committees also helped with monitoring and managing school feeding resources, helped maintain, store, and distribute food and school infrastructure for their school feeding programs, and kept records of food contribution, meals, and related school feeding data for their respective programs.

Women empowerment groups, established by the school feeding project, are groups of mostly women and mothers in school feeding communities that participate in SILC groups. These groups use their business acumen and financial information learned through their participation in SILC to acquire financial and material resources for their school feeding programs, as well as to improve their own income. They also donate their own labor, time, and food to support and aid their school feeding programs in achieving sustainability. Additionally, these women are involved in the building and maintaining of new school infrastructure, like WASH facilities. As for research and development partnerships, PCI worked with the National Institute of Transport to implement school feeding activities

Table 1.17 Summary of Partnerships With Community-based Groups for School Feeding Under MGD Tanzania

PARTNER	CONTRIBUTIONS TO SCHOOL FEEDING
Education Cascade Groups (Mwalimu Wa Kwanza)	They helped increase child literacy in school children by teaching reading techniques and practices in children ages 2 to 4.5 years in the community.
Government Parent Teacher Association	This association provides their community school feeding programs with annual school feeding implementation plans on how to implement key school feeding elements.
School Committees	School committees provide their community's school feeding program with organizational strategies, material resources, monitoring and management that will allow program sustainability.
Women Empowerment Groups	These groups provide their community's school feeding program with material and financial resources that aid in program sustainability.
National Institute of Transport	They help implement and sustain McGovern-Dole school feeding activities by designing a freight manual.

Source: Partnerships Assessment Tool developed by authors from MGD documentation and interviews with key informants

associated with the shipping and transportation of food commodities. This was achieved by the creation of a freight manual created to address school feeding program needs.

These research and community partnerships aid in program sustainability by creating a sense of community responsibility to support the school feeding program. Additionally, these partnerships place the ownership and everyday functioning of school feeding elements into the hands of school personnel and community members. Overall, these partnerships may lead to program sustainability because they have allowed the community to slowly take over the operation of the core elements of school feeding, like food procurement and production, funding, and program monitoring and organization. While these community groups seem to have produced some sustainability at present, there is no way to make community-led school feeding programs completely sustainable in their current forms. The programs will not be sustainable without more support from the central government in the form of budgeted funding, school feeding policy creation and implementation, and material support. In phase 3 of the Tanzanian school feeding program, PCI and its personnel were optimistic about school feeding program sustainability, and these partnerships, especially between the schools and communities, were somewhat easily formed. Nevertheless, women and mothers are oftentimes contributing the most material and immaterial resources compared to their male counterparts which may result in the undesired consequence of creating further food and financial insecurity in targeted communities at the household level.

In essence, public, private, non-profit, community, and research and development partnerships can all contribute to school feeding. As demonstrated in the prior sections, public partnerships often provide a great deal of school feeding oversight and ensure policy adherence. Public partnerships helped contribute to school feeding sustainability by allowing the Government of Tanzania to actively contribute to school feeding through the provision of both material and immaterial resources and by establishing their presence and dedication to program oversight and food quality. These resources are invaluable but need to be supplemented by purposeful efforts to build school feeding program funding into the government budget. Private partnerships, on the other hand, primarily provided access to food processing and other elements associated with the school feeding supply chain.

Regrettably, school feeding programs have a noticeable lack of private partnerships, even though private partnerships are necessary to the sustainability of school feeding. The need for more of these partnerships is easily demonstrated by the government's lack of ability to ensure all elements of the school feeding supply chain are consistently present, closely connected to school communities, and able to provide food in a timely manner that has been fortified with the necessary nutritional contents desperately needed by the food insecure students and communities targeted by school feeding programs. Non-profit relationships ensure that school feeding program components are properly implemented. These non-profits provide personnel and other resources that allow school feeding programs to continue implementing all the previously discussed components. Implementation resources are sorely needed as much of the local government is understaffed and cannot provide the amount of technical assistance needed by many of the school feeding programs during implementation.

Community partnerships ensure each school feeding program is adequately supported, organized, and led by community members. Community partnerships also create a sense of ownership of each school's feeding program. These partnerships are the most integral, outside of public and private partnerships, to the sustainability of school feeding because the community is expected to take on the lion's share of food provision, organization, and future functioning of each community's school feeding program. Many of the community groups, like the women empowerment groups and community farmer groups, provide the bulk of the funds, food, and labor to sustain their respective school feeding programs. Research and development partnerships mainly resulted in the creation of tools and techniques (e.g., the shipping freight manual) that streamlined the supply chain and shipping processes associated with school feeding. These partnerships help sustain school feeding by helping to modify the supply chain in ways that may result in a supply chain wherein freight and food transportation costs are more affordable when trying to import food from neighboring countries. Overall, all types of partnerships aid in the sustainability of school feeding, but there are some partnership gaps and the disproportionately female school feeding burden that need to be addressed to really stabilize school feeding sustainability in Tanzania.

Research Component 2: Analysis of Local Procurement

Burkina Faso, Kenya, & Rwanda

Introduction

One of MGD's overarching program level goals is to successfully transfer the leadership and administration of the school feeding activity to each participating country's government. To have a successful transfer of school feeding, MGD sought to establish and strengthen school feeding capacity and sustainability by ensuring that schools could procure locally school feeding resources. With a focus on establishing local and regional procurement, MGD funded parallel LRP projects to be implemented alongside prior established MGD school feeding project components. Overall, Local and Regional Procurement projects primarily seek to establish country specific procurement models that allow school feeding programs to provide food and resources for school feeding in a cost-effective, timely manner that utilize local markets, smallholder farmers, and other local actors and organizations present in the school feeding supply chain.

Research component 2 seeks to answer the question of "how do the impacts of local procurement models and other community and nationally sourced models compare with those that rely on international food sources related to farm productivity enhancement (including financial management, input efficiency, and profitability), employment, and agricultural markets?" While data limitations did not allow all parts of the above question to be addressed, this section of the report presents the results of the analysis of the Local and Regional Food Aid Procurement (LRP) model under MGD implementation. The first part presents background information about the program, and information about different LRP activities and mechanisms. The second part of this component includes a case study analysis of the three countries of interest for this research question: Burkina Faso, Kenya, and Rwanda. This is followed by a report of the LRP performance indicators, and comments about the LRP monitoring system. This section closes with a discussion about performance data and some recommendations for future research.

Local and Regional Procurement (LRP) in MGD Programming

Background

LRP refers to programmatic efforts that facilitate the acquisition of food from sources in the same community, country, region, and/or continent, rather than international sources. While LRP can generally refer to the act of procuring food as described above, it can also specifically refer to the USDA's Local and Regional Food Aid Procurement project and since 2021, to the MGD component to carry out local procurement activities under the MGD program, often abbreviated as the LRP. LRP projects began as a pilot program authorized in the 2008 farm bill, with the first projects funded in FY 2009. USAID implemented its own LRP activities with funds appropriated in an FY 2008 supplemental appropriations act (P.L. 110-252). The MGD program, authorized by the Farm Security and Rural Investment Act of 2002, dictates that funds will be used for the purchase of US-produced commodities and for the provision of financial and technical assistance. The only explicitly LRP-type activity sponsored by earlier iterations of the MGD program appears to have been school gardening and larger community farm programs in select projects. Congress established the USDA's LRP (7 U.S.C. 1726c) through the Agricultural Act of 2014. The 2014 Farm Bill, Section 3206 of the Food, Conservation, and Energy Act of 2008, as amended by the Agricultural Act of 2014, stipulates that the Secretary of Agriculture will provide grants to, or enter into cooperative agreements with, eligible organizations to implement field-based projects that consist of local or regional procurements of eligible commodities in developing countries to provide development assistance and respond to food crises and disasters. The intended outcomes of USDA's LRP projects are to enhance trade capacity of food-insecure developing countries and address the causes of chronic food insecurity. The Agriculture Improvement Act of 2018 (signed December 20, 2018) revised the McGovern-Dole authorizing statute to provide that no more than 10% of MGD project funds shall be used for the local and regional procurement of commodities. For FY 2020-2021, all new MGD projects grants must include an LRP "component" in addition to the traditional uses of MGD funds (personal communication with MGD staff, 2/4/22).

Table 2.1 reports the annual appropriations made to MGD and LRP from 2004 to 2021. Since 2010, MGD

Table 2.1 Annual Congressional Appropriations to MGD and LRP

FY	MGD	LRP
2004	$50,000,000	
2005	$87,500,000	
2006	$100,000,000	
2007	$100,000,000	
2008	$100,000,000	
2009	$100,000,000	
2010	$209,500,000	
2011	$199,500,000	
2012	$184,000,000	
2013	$184,000,000	
2014	$185,000,000	
2015	$191,600,000	
2016	$196,600,000	$5,000,000
2017	$196,600,000	$5,000,000
2018	$205,000,000	$10,000,000
2019	$195,000,000	$15,000,000
2020	$220,000,000	$0
2021	$230,000,000	$0
Total	$2,934,400,000	$35,000,000

Source: Partnerships Assessment Tool developed by authors from MGD documentation and interviews with key informants

has received approximately $200 million per year, whereas LRP, which was first funded in 2016 (not including expenditures on earlier pilot projects), received $5 million per year for 2016 and 2017, $10 million in 2018, and $15 million in 2019, representing an expenditure increase of 200% over the funding period. The USDA's LRP projects did not receive appropriated funds under the FY 2020 Further Consolidated Appropriations Act or the Consolidated Appropriations Act of 2021. Instead, Congress directed that LRP-type activities be embedded within MGD projects. The FY 2020 Further Consolidated Appropriations Act specified that, of the $220,000,000 made available for MGD, no more than 10% and no less than $20,000,000 (roughly 9% of total expenditures) shall remain available until expended for the local and regional procurement of agricultural commodities under MGD. In FY 2020, each of the nine MGD awards made included a local and regional agricultural commodity procurement component.

Table 2.2 reports the individual LRP projects funded during FY 2016-2019. Seven projects were funded in Africa, three in Latin America, and two in Asia. Four projects were implemented by the World Food Program (WFP), three by Catholic Relief Services (CRS), three by Project Concern International, one by Counterpart International, and one by World Vision. Over these four years, it is estimated that LRP efforts carried out in the seven countries benefited almost 300,000 people. The following list summarizes the types of activities carried out under LRP projects, as summarized in annual LRP Reports to Congress.

LRP Activities

- Procure locally grown agricultural commodities.
- Supplement and improve school feeding programs with locally procured eggs, fruits, and vegetables.
- Leverage ongoing local procurement programs.
- Contract with farmers to produce drought-resistant crops.
- Work with farmers to grow and sell produce.
- Link local producers with schools.
- Establish local farmer groups.
- Train farmers on improved agricultural techniques and post-harvest handling and storage.
- Train farmers on business administration, including improved pricing and marketing techniques, managing forward contracts and agribusiness.

Table 2.2 LRP Project Recipients, Award Values, and Estimated Number of Beneficiaries

FY	Country	Recipient PVO	Award Value	Estimated Beneficiaries
2016	Laos	World Food Program	$1,000,000	10,000
2016	Rwanda	World Food Program	$2,000,000	46,106
2017	Benin	Catholic Relief Services	$1,960,000	1,318
2017	Kenya	World Food Program	$1,000,000	31,150
2017	Mozambique	World Vision	$2,000,000	25,127
2017	Tanzania	Project Concern International	$2,000,000	17,108
2018	Guatemala	Project Concern International	$4,000,000	10,922
2018	Honduras	Catholic Relief Services	$2,400,000	16,570
2018	Senegal	Counterpart International	$3,599,772	31,708
2019	Burkina Faso	Catholic Relief Services	$4,800,000	49,130
2019	Cambodia	World Food Program	$4,700,000	45,900
2019	Nicaragua	Project Concern International	$5,500,000	10,609
Total			**$34,959,772**	**295,648**

Source: USDA-FAS

- Train school procurement committees on food quality, stock control, food preparation, and data collection.
- Train parent associations on quantifying food received, record-keeping, quality control, menu selection, and supplier selection.
- Train farm groups on purchasing processes and procedures.
- Train government officials to increase local procurement capacity, including budgeting, contracting, procurement, quality control, storage, monitoring, and evaluation.
- Organize online training sessions during Covid-19.
- Provide price information and conduct market analyses to inform procurement, mitigate potential negative impacts on local markets, and improve negotiating.
- Help governments assess local agricultural sectors to identify and map locally produced commodities.
- Provide low-cost storage equipment.
- Rehabilitate or construct kitchens with firewood-saving stoves and storage rooms.
- Facilitate forward delivery contracts between private-sector off-takers and market-ready farmer organizations.
- Support cooperatives.
- Establish partnerships with financial institutions that support farmers' access to loans.
- Demonstrate the importance of school meals and the feasibility of local procurement.
- Work with parent-teacher organizations to provide supplementary commodities from their own private production to promote community engagement.
- Strengthen and expand local garden production.
- Provide training, tools, and planting materials to support community demonstration farm production of fruits and vegetables.
- Distribute cash transfers to schools to buy fresh fruits and vegetables (using sources different from USDA-LRP).
- Arrange exchange visits for farmers from other districts and government officials.
- Plant fruit trees.
- Expand greenhouses.
- Start awareness campaigns about the production of new crops and their health benefits.
- Integrate health and nutrition education into school curricula and develop menus that use culturally acceptable, nutrient-rich foods.

Other LRP-Type Programs

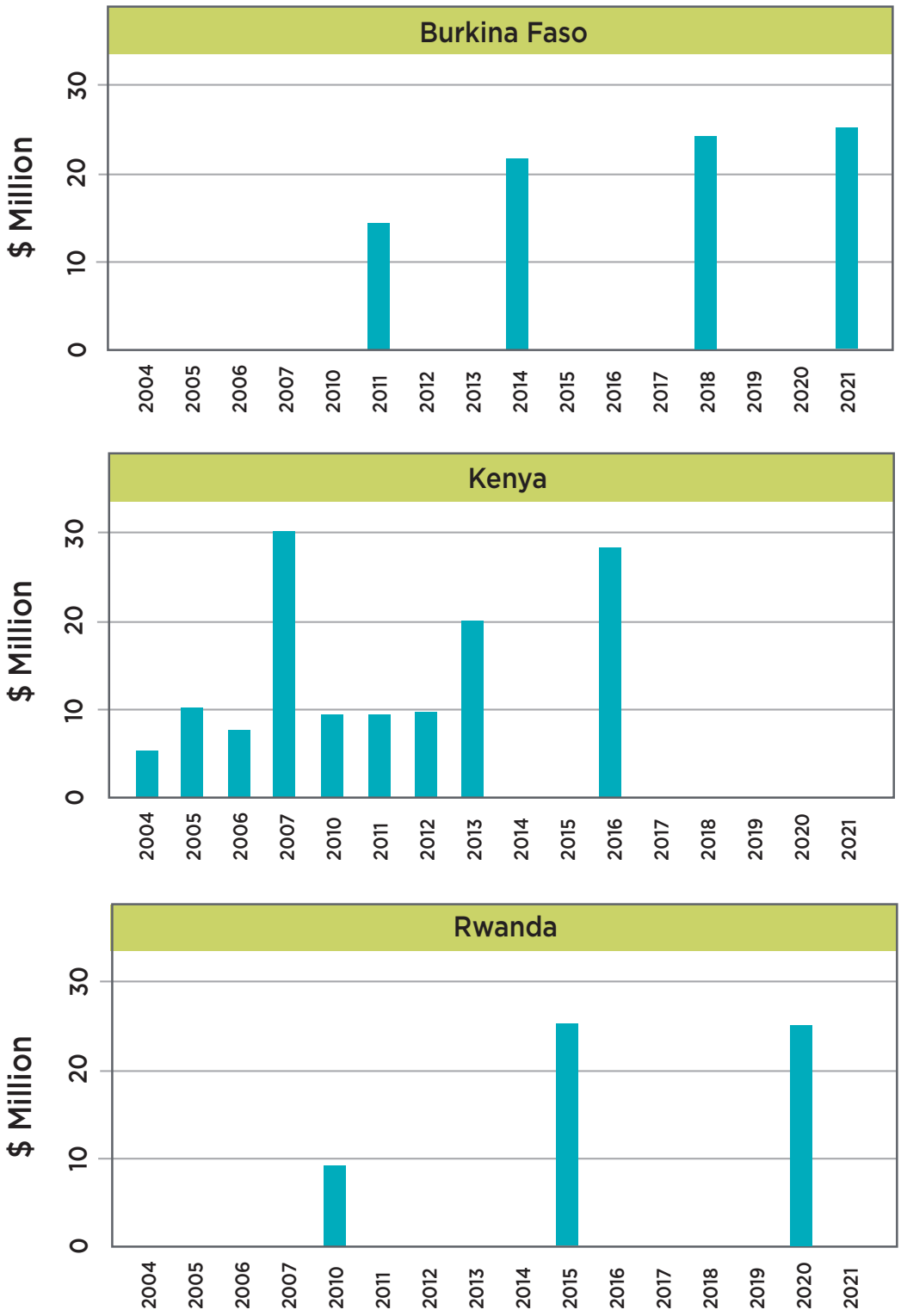
The MGD's LRP projects are specific examples of a mechanism that can contribute to the development of HGSF programs. Using the HGSF model, locally sourced meals are provided daily to children attending schools (FAO & WFP, 2018). The LRP program can work separately or synergistically with other HGSF programs. One of the stated goals of Kenya's LRP project, for example, was to support the Government of Kenya's existing HGSF program, called the HomeGrown School Meals Program (HGSMP), administered by the WFP. In 2014, at least 47 countries in sub-Saharan Africa were implementing school feeding programs, of which at least 20 used HGSF or comparable models (Singh and Fernandes, 2018). Several studies have attempted to quantify the differential impacts of LRP/HGSF programs relative to alternative modalities (Clay and Benson, 1990; Walker, Coulter, and Hodges, 2007; Garg, et al., 2013; Gelli, et al., 2016; Haggblade and Tschirley, 2007; Hanrahan, 2010; Tschirley and del Castillo, 2007; Violette, et al., 2013; Walker and Wandschneider 2005). Lentz, Mercier, and Barret (2017) argue that LRP is more efficient in terms of both cost and delivery time, and less likely to hurt local markets than those requiring procurement from donor producers. Lentz, Passarelli, and Christopher (2013) found that procuring cereals, locally or regionally, provided savings of 53% relative to purchasing grains in the US, while procuring legumes and pulses locally and regionally saved 25%. The authors also reported, however, that procuring vegetable oil in Latin America provided no additional savings compared to purchasing US vegetable oil. Harou et al. (2013) found that local procurement was 38% cheaper than in-kind food delivered to school feeding programs in Burkina Faso, and that the local foods were more nutrient-dense. Regarding the impact of LRP on local agricultural markets, Garg et al. (2013) found that, with a few exceptions, local and regional procurement activities have no statistically significant relationship with either local price levels or volatility. Violette et al. (2013) found that recipients of locally procured foods were generally more satisfied with their meals relative to those who received US-sourced foods, especially among poorer recipients.

While the addition of an LRP component to MGD program projects represents a relatively recent change, LRP has become the norm internationally. The European Union and its member states, who combine to represent the second-largest food aid donor in the world, issued a regulation in 1996 favoring LRP over traditional food aid modalities; and Canada, also a leading food aid donor, provides nearly the entirety of its food aid in the form of cash for local procurement, vouchers, or cash distributions (Lentz, Barrett, and Gomez 2012). LRP's share of global food aid rose from 11% of global food aid in 1999 to 39% by 2008, during which time the U.S. – accounting for more than half of all food aid globally – did not permit LRP (Barrett, Binder, and Steets 2011). Lentz, Barrett, and Gomez (2012) warn, however, that LRP should not be viewed as a perfect solution to the challenges of providing food aid. They point out food safety and quality standards are highly variable across countries, and local procurement could increase the delivery of unsafe or low-quality food. Additionally, Barrett and Maxwell (2005) warn that procuring food where local markets cannot respond adequately could drive up prices and volatility. They conclude, however, that the evidence is in favor of including LRP activities within the international food aid portfolio. Given the findings of previous research, local markets must be deemed adequately suited to the task of providing high-quality and sufficient quantities of food for an LRP program to thrive.

Case Studies of Burkina Faso, Kenya, and Rwanda

To understand the structure, role, and outcomes of USDA-funded LRP projects, this study focuses on three African countries: Burkina Faso, Kenya, and Rwanda.

Figure 2.1 MGD awards by year for Burkina Faso, Kenya, and Rwanda



Source: Authors based on information from MGD Annual Report to Congress Key Findings from Country LRP Evaluation Reports

Rwanda had one of the first LRP awards in FY 2016, receiving $2 million in funding. Kenya received a $1 million award the following year, and Burkina Faso received a $4.8 million award in FY 2019, the last year of individual LRP awards prior to LRP's complete integration into subsequent MGD program projects. All three countries were prior recipients of MGD awards. Figure 2.1 reports the award amounts of each country by year, according to the MGD Annual Reports to Congress. Kenya received seven MGD awards between FY 2004 and FY 2016, totaling $101.7 million. Burkina Faso received their $1 million LRP award one year after the last award in FY 2017. Rwanda received three MGD awards between FY 2010 and FY 2020, totaling $59.1 million, receiving their $2 million LRP award in-between MGD grant cycles in FY 2016. Note that their FY 2020 award contained the required 10% LRP component. Burkina Faso received three MGD awards between FY 2011 and FY 2021, totaling $70.6 million, receiving their $4.8 million LRP award in FY 2019. Note that their FY 2021 award contained the required 10 % LRP component.

Burkina Faso

In 2010, CRS began a one-year USDA-funded LRP pilot-project called Local Education Assistance and Procurement (LEAP). In 2019, Burkina Faso implemented their second LRP project, Faso Riibo (FR). A report published by the USDA in October 2020 provides information regarding the FR program and results from a baseline evaluation of the project (USDA, 2020). The FR project was implemented by CRS with the goal of serving 191 schools in nine communes located in the North Central region of Burkina Faso from October 2019 to September 2023. The project was intended to reach 47,670 students and 1,433 additional beneficiaries including teachers, producers, buyers, and transporters. The FR project focuses on the delivery and distribution of four commodities: rice, millet, cowpea, and cotton oil. The primary goals of the FR project include 1). Increasing the capacity of mayor's offices, school communities, and producer groups to procure, market, deliver, and store local and culturally acceptable foods that can be used to supplement school feeding programs in an efficient and timely manner through training, provision of guidance materials, and the monitoring of food quality and management efforts; 2). Strengthening market linkages through work with actors along the four selected commodity value chains; 3). Improving Small Holder Farmer's (SHF) access to school feeding purchasing markets by providing training in storage, delivery, and food quality/safety standards. The logic of the FR project was based on a theory of change that argued if the cost-effectiveness and timeliness of food provision and the use of culturally appropriate and nutritious foods improve, then the local and regional food supply will prove to be an effective and efficient method for providing school meals (BF.LRP.Baseline.2019-2023).

Data collection for the FR baseline report was conducted in June of 2020. The data collected included a survey of 259 students in 18 sample schools; a survey of 186 producers; semi-structured interviews of mayors, canteen managers, buyers, transporters, teachers, cooks, and basic education district managers; and focus groups with producer groups, processor groups, and members of school management committees (BF.LRP.Baseline.2019-2023).

The purchase and ordering of food for the FR project is administered by Municipal Councils (MCs). These MCs select the food and proportions of each food type to purchase. After selection, a national call is made to identify tenders or local producer groups who will fill the MC's order. This process terminates once the order is received. Upon initial receipt of food orders, the quality of the commodities must first be approved prior to sending the food to school canteens. One of the challenges identified for the efficient implementation of the FR project is significant delays in the receipt of food orders by canteens. Only 22% of communes were able to obtain food orders within the time limits specified by their MC procurement plans. On average, communes experienced a 90-day delay in the procurement of food orders. This delay was determined to be the result of three main factors: The lack of dedicated commune staff to administer orders, complexities of the local and regional procurement process, and the current quality control process used to vet commodities and approve them for consumption. A particularly important barrier to the timely delivery of LRP commodities in the FR project is Burkina Faso's current quality control system. Specifically, the timely delivery of quality control tests conducted by contracted laboratories caused significant delays in the delivery of food orders to canteens. While food deliveries are undergoing the quality control testing process, commodities are stored without sufficient maintenance or treatment, leading to reductions in the quality of delivered commodities and commodity losses due to a share of the purchased foods being deemed unfit for consumption after experiencing improper storage conditions. The delays identified during the testing

processes were sufficient to cause losses in the quantity and quality of the commodities received by canteens, representing a major limiting factor to the effectiveness of the FR project. If the number of testing firms and the timeliness of their quality control process was improved, the LRP project in Burkina Faso may operate more efficiently and effectively than their baseline levels indicate.

Another issue identified in the baseline report is with the current LRP supply chain, particularly with regard to transportation and delivery in remote locations. Some transporters were found to lack sufficient knowledge of the challenges in delivering commodities to remote locations, and in most cases, their transportation vehicles and methods were found to be insufficient for delivery to such communities. Therefore, the baseline data identifies the need for improvements to local transportation and transporter knowledge for the FR project to prove effective.

In the survey of individual producers conducted for the FR baseline report, 24% of local producers were found to be women, while the remaining 76% were men. All women in the sample were small producers, and 81% of producers had no formal education. In the 2018/2019 crop year, the average production per producer was 307 kg of millet, 26 kg of rice, and 146 kg of cowpea. The aggregate quantity of commodities sold by farmers receiving USDA assistance in the region was 183 tons. The baseline report found that local producers, cooperatives, and processors have the capacity to satisfy the annual commodity demand of the FR project over the 2021-2023 period. Therefore, the current agricultural system in the region is capable of meeting the gross quantity needs of Burkina Faso's LRP project. At the time of the baseline report, however, only 22% of producer organizations complied with contracted delivery dates, commodity quantity stipulations, and commodity quality standards. The prices offered for commodities through the FR project were also seen as low according to producers, and some disruption to local agricultural markets from aid programs and subsidized grain purchases were identified in the baseline report. While all producers in the baseline were interested in participating in the FR project, they stated the need for improvements to technical capacity, equipment, and factors of production, conservation, and processing. Additionally, most wholesalers in the baseline communes purchased their commodities from local collectors rather than cooperatives. This is due to the relatively high prices of cooperative commodities compared to general market prices. Producer cooperatives and processors suggested the following changes to help ensure their ability to satisfy project needs: 1) Improved transparency and communication throughout the process; 2) Timely information provided to cooperatives regarding the needs of contract implementers; 3) Down payment offers on each order with the remainder of funds being distributed at the time of receipt, and 4) Commodity prices higher than the current market price. Taken together, these baseline results suggest that while the region's agricultural sector was adequate to provide the desired quantities of commodities for the FR project, changes to agricultural production and commodity prices could prove beneficial in strengthening the program's effectiveness. These changes are especially important to supporting SHFs and farmers participating in local cooperatives. With these changes, the share of commodity contracts that adequately meet the contracted delivery criteria may improve.

In conclusion, the results of the FR baseline report identify substantial limitations to the timely delivery of LRP commodities to school canteens. These limitations largely stem from the slow nature of Burkina Faso's current quality control process and issues with transportation to remote communities. Commodities arrive late in most cases and these slowdowns lead to a loss of stocks due to poor management and storage procedures. Decreasing the amount of time spent on quality control and transportation has the capacity to significantly improve the FR project's efficiency and effectiveness. Additionally, while the local agricultural system produces a suitable volume of commodities to satisfy the FR project's needs, improvements to technical capacity, communication, storage, and processing equipment are needed to meet the program's quality standards. Improvements to these factors can be made through the direct efforts of the FR project, producing a stronger local agricultural system that has the capacity to sufficiently meet project needs. Furthermore, the means for commodity transport exist at the commune level, but the knowledge and equipment used by transporters should be improved to strengthen the program's effectiveness. Three of the specific recommendations identified in the baseline report include: 1) Creating a framework for CRS, educator, and supplier "town halls" to improve communication and the flow of information along the purchasing chain; 2) Establishing agreements with quality control testing laboratories to ensure the timely delivery of testing results, and 3) Providing measures to improve hygiene standards in schools and improving the equipment and facilities of canteens.

One of the key assumptions for the success of the FR project is that the security situation in Burkina Faso does not deteriorate from its baseline state. In January 2022, the nation experienced a military lead coup, which ousted the country's democratically elected president. At the time of this report, it is unclear how this change to the nation's security situation will impact the FR project's capacity, capabilities, and efficiency. It is vital that the evolving security situation and its effects on LRP be monitored in future research to ensure that the program can satisfy its key objectives. Many of these impacts can be measured when the end line report for the FR project is published towards the end of the project period.

Kenya

The most recent USDA funded LRP project in Kenya was conducted by the WFP from 2017 to 2020. The LRP project was implemented in three arid counties in Kenya's Northwestern region: Baringo, Turkana, and West Pokot. A baseline report for the project was released by the WFP in 2018, and an end line report was released in 2020 (KY.LRP.Baseline.2017-2020, KY. LRP. End line.2017-2020). The LRP project included several key objectives including: 1) Improving the effectiveness of food assistance by improving cost-effectiveness and improving timeliness; 2) Increasing the capacity of suppliers and school meal procurement committees to effectively and efficiently procure local commodities for school meals which promotes sustainability of school feeding; 3) Strengthening local and regional food market systems, which improves access to culturally acceptable commodities and connecting them to Government of Kenya's HGSMP; 4) Improving the nutrition of students by increasing access to and the use of various high quality, nutritious, and culturally appropriate foods in school meals. To meet the LRP project's goals, the project implementers engaged in five major activities: 1) Assessment of local food systems; 2) Capacity building for national and county institutions; 3) Capacity strengthening for local traders and Farmer Organizations (FOs); 4) Develop school meal menus using local and nutritious commodities; 5) Procure locally produced, drought-tolerant crops.

For context, the Kenyan government started its HGSMP in 2009 (see "Partnerships section: Case Study #1: Institutional framework"). The HGSMP largely provides cash transfers to schools, allowing them to purchase commodities on local markets to offset food deficits. Schools in the arid Northern region of the country were added to the HGSMP last, with the three LRP counties being added to the project by 2018. These counties were added later in the HGSMP's life due to concerns regarding local agricultural markets' abilities to satisfy food requirements at an efficient price. Prior to their addition to the HGSMP, schools in the arid North were supported with in-kind commodity transfers. The LRP project was designed to transition LRP schools to the Kenyan government's HGSMP, improving access to school meals and strengthening local agricultural markets by facilitating production and creating new agricultural jobs. With the cash transfers provided by the HGSMP, schools can purchase their own commodities on local markets with the goal of decreasing delivery times, reducing costs, and increasing the diversity of purchased commodities. This approach is notably different from the LRP projects in Burkina Faso discussed above and Rwanda discussed below, allowing this study to identify the impacts of a relatively unique set of project goals. Additionally, given the transitional nature of the LRP project, identifying the sustainability of the project's impacts is of particular importance.

To evaluate the LRP project's impacts, the WFP collected mixed methods data which includes both quantitative and qualitative data from various stakeholder groups. The evaluation report also utilized the WFP's own monitoring data used to construct the PMP. Data collected for the evaluation included three quantitative surveys from FOs, local traders, and schools. Qualitative field interviews and focus groups were also conducted to collect data for the evaluation.

The end line report identifies three primary beneficiaries of the LRP project: traders, FOs, and schools. At end line, 79 FOs were registered with the LRP project. These FOs included 39,682 farmer members. With regards to local traders, the report identified 28 traders participating in the LRP in Baringo and West Pokot. This number was down from 54 total traders included in the baseline data collection. Finally, 191 schools were included in the report's end line data collection, including 96 LRP schools and 95 non-LRP schools.

LRP project stakeholders reported that the program's activities were highly relevant. Relevant activities included VCAs which were used to identify the minimum cost needed to supply school meals in each county, nutrition-related activities that facilitated diversity in school meals, and the training of FOs and traders on the HGSMP

procurement process. Alternatively, FDCs in Turkana which were used to facilitate direct commodity purchases were found to be less relevant as they ran contrary to the LRP project's goals of allowing schools to conduct their own procurement with cash transfers. LRP project activities were also considered well linked by stakeholders, implying that the program's activities worked synergistically to achieve its goals. The LRP project's activities also aligned well with the Kenyan government's goals of increasing schools' local commodity procurement capacity and the ability of local agricultural systems to produce adequate quantities of commodities to support the program.

WFP conducted multiple market assessments outlined in their end line report to establish the ability of local markets to satisfy HGSMP demand. These assessments found that local agricultural markets in the three LRP project counties were capable of producing enough aggregate quantities of commodities to satisfy the HGSMP. While the land was suitable for the program's four drought-tolerant crops— sorghum, cowpeas, green grams, and millet— the consumption of these commodities was relatively low in the region. This low rate of consumption was found to be driven by low levels of current production and high market prices relative to maize and beans. To improve the local agricultural system, WFP was allowed to support the school meal program by purchasing 80 mt of cowpeas and 288 mt of sorghum from producers in Turkana. This effort was intended to stimulate local agricultural production and create connections between FOs and the HGSMP. Due to the high prices of both commodities in the county, farmers and FOs were contracted through FDCs. The WFP selected five FOs for their FDCs. FOs were chosen based on their production capacity, ability to meet the WFP's price, and their ability to meet the WFP's procurement requirements. Due to a concurrent drought, the WFP provided 1,275 farmers with maturing cowpea seeds to offset low sorghum production. This approach allowed FOs to largely satisfy the requirements of their FDCs in 2018 and additional contracts were created for the 2019 season. With WFP assistance, FOs delivered 95.5% of their contracted commodity volume. While the FDC approach ran counter to the HGSMP's goals of allowing schools to purchase their own commodities with cash transfers, the effort did highlight the ability of local agricultural systems to satisfy LRP project requirements when offered adequate support. The FDCs provided by WFP also provided FOs with a guaranteed market for their commodities, strengthening the production of drought-resistant crops in the region.

Another goal of the LRP project was to increase school meal purchases from SHFs. To this end, the WFP worked with the Kenyan government to draft a proposal that 30% of all HGSMP commodities come from the country's SHFs. This effort ultimately proved unsuccessful, but the WFP was able to estimate the potential benefits of purchasing more food from SHFs in a 2019 assessment. The assessment found that there was a viable market for SHFs in the country. Additionally, increasing the share of HGSMP commodities from SHFs was estimated to increase local economic wellbeing, increasing the program's overall benefits. Stimulating production of local SHFs would also significantly strengthen the HGSMP's local economic benefits. While the WFP's efforts to increase SHFs' share of HGSMP commodities were largely ineffective, the impact of LRP on SHFs in Rwanda discussed below further highlights the potential benefits of improving SHFs' capabilities.

The LRP project was also intended to strengthen the capacities of local traders and FOs. To accomplish this goal, local traders and FOs were identified for HGSMP training which sought to increase awareness of the HGSMP procurement process and requirements and enable local traders and FOs to effectively and efficiently participate in the program. Specific training domains included training in post-harvest handling and storage, collective marketing, food safety and quality, and HGSMP bidding and contracting procedures. The end line report identified 3,099 FO members and traders who benefitted from trainings offered by the LRP project. This increase led to a significant improvement in the number of members FOs stated to having received training from roughly 36% at baseline to approximately 74% at end line. FOs also indicated that trained members would pass their knowledge along to untrained members, representing an educational spillover effect. FO members stated that these trainings were useful, but some material was seen as too difficult for trainees with low levels of education. The WFP also organized four market linkage forums that brought FO members, traders, teachers, and county education officers together in a formalized space. Forum participants stated that these methods were effective, increasing the share of foods purchased from local FOs. FOs in Turkana were also offered direct funding from the WFP to start flour milling operations which could process maize and sorghum. Additionally, certain FOs were given agricultural equipment meant to improve commodity quality, business training, and poultry.

To measure the impact of LRP project investments in local agricultural markets, the end line report included several outcome analyses. Unfortunately, the number of FOs actively producing major HGSMP crops decreased from baseline to end line save for bean production. From qualitative interviews, the report indicates that this decrease is most likely the result of drought during the period, but FOs also cited a lack of demand after discovering that the HGSMP would no longer be directly purchasing commodities in their counties. While quantity decreased at end line, measures of quality had improved. The report identifies significant improvements in quality monitoring by FOs, including commodity sorting and cleaning. These changes were determined to largely be the result of trainings offered by the LRP project. Additionally, while the share of crops sold remained the same for FOs in Baringo and Turkana, West Pokot saw an increase in the percentage of production sold at end line relative to baseline. The end line report also identified a notable increase in the percentage of FOs aggregating and marketing member produced commodities. This change suggests that the business practices of FOs improved as a result of the LRP project's efforts. According to FO representatives, the primary barriers to successfully selling FO member commodities were poor transportation infrastructure, volatile prices, and low demand from consumers. Even with these barriers, however, the LRP project produced a significant increase in the share of FOs who reported selling member commodities. Contrary to the program's stated goals, fewer traders reported selling their commodities to schools at end line relative to baseline in Baringo. In West Pokot, however, the same share increased significantly from 32% at baseline to 72% at end line. Additionally, traders in Baringo reported an increase in the diversity of sold commodities, but the diversity of goods sold by traders in West Pokot remained unchanged from baseline. As a part of data collection for the end line report, traders were asked to identify major barriers to purchasing commodities from local farmers. Traders stated that transportation costs and low prices represented major barriers as well as the low volume of commodities produced by the local agricultural sector.

An additional goal of the LRP project was to improve the cost-effectiveness and efficiency of school meal provisions by allowing schools to directly purchase commodities from local sources. The CCD was determined at both baseline and end line, identifying the cost of providing food to schools in the three LRP counties. Due to programmatic and climatic issues, however, few LRP schools received their pre-determined cash transfers or commodities in the end line period. Therefore, the report was unable to identify the LRP project's impact on CCD. Furthermore, these same issues prevented the execution of a sufficient end line evaluation of the timeliness of commodity procurement. Qualitative data from the end line report, does suggest that the Ministry of Education's procurement process was challenging. Like Burkina Faso, Kenyan schools experienced significant delays in the delivery of commodities to schools. Delays were most prevalent after food had been delivered to counties due to transportation difficulties. County food storage facilities were also found to be inadequate, harming food quality and safety. Future work is needed to understand how Kenya's HGSMP costs compare to the traditional per-student costs spent to provide school meals through non-local sources. Additionally, for the 18 schools in West Pokot that received cash transfers through the LRP project, timeliness of food delivery decreased at end line relative to baseline, a change which the report identifies as being due to delays in cash transfers.

Taken together, the results of the Kenyan LRP project's end line report suggest that the project had some positive impacts on local agricultural sectors in the three counties. The project was unable to meet its goals of improving timeliness, cost-effectiveness, or improved nutrition of school meals as measured by the end line report's outcomes of interest. The LRP project facilitated communication and partnerships between FOs and local traders, and both groups received a considerable amount of training as a result of the program. The transition to cash transfers under the HGSMP did produce some unintended negative effects, however, after FOs and traders realized that the Kenyan government would no longer be purchasing commodities directly. FOs planning to sell their commodities to HGSMP schools experienced a larger share of unsold stock when schools were unable to complete their purchases.

With regards to the LRP project's sustainable impacts, while the transition from in-kind to cash transfers reduced the effectiveness of LRP, it did not decrease the HGSMP's ability to effectively provide school meals as stated by the end line report. Independent of the HGSMP's modality, however, the improved relationships between FOs and traders will hopefully prove sustainable in the long run. The least sustainable aspect of the LRP project identified in the end line report is the use of drought-resistant crops. These commodities are less cost effective than traditional

products, so schools will likely transition from drought-resistant commodities to maize and beans once they are able to purchase food directly with cash transfers. Given the arid nature of the LRP counties, this change may leave the HGSMP susceptible to climatic shocks in the future. Future research is needed to monitor the ability of local purchases to sustain school meal programs in the region.

Rwanda

Rwanda's LRP project was awarded in 2016 and implemented from 2017 to 2019. A baseline and end line report for Rwanda's LRP project was conducted by the WFP in 2017 and 2019, respectively (RW.LRP.Baseline.2017-2019, RW.LRP.End line.2017-2019). The LRP project's primary goal in Rwanda was to improve food assistance effectiveness by procuring commodities for school meals from SHFs participating in local cooperatives. Of the $2 million awarded to the program, $1.36 million was used to purchase commodities from SHFs, representing the majority of all project spending. Rwanda's LRP project was implemented by WFP and covered four districts (Nyamagabe, Nyamaguru, Huye, and Gisagara). Expected outcomes of the LRP project included: 1) Improving access to loans and agricultural markets; 2) Improving meal quality; 3) Enhancing cooperative capacities reflected by increased sales; 4) Reducing commodity losses. Data collected for the baseline report provided project relevant measures from the period before the LRP project's introduction that were compared to end line measures collected at the end of the project life. These data can be used to evaluate the program's impact on key outcomes of interest. Quantitative and qualitative data were collected for the baseline and end line, including secondary data review, survey, key informant interviews, and observation.

The LRP project in Rwanda had several planned activities, including: 1) The purchase of beans and maize from SHFs in Rwanda and other regional markets (e.g., Tanzania and Uganda); 2) The training of SHFs in procurement of raw materials, processing, business management, and marketing; 3) The facilitation of trade and market relationships between milling cooperatives, factories, and 16 cooperatives producing unprocessed commodities; 4) The training of SHF cooperatives on post-harvest handling and storage, warehouse management, organizational governance, agricultural markets, business planning, microfinance, and production techniques; 5) Coaching cooperatives on business plan implementation; 6) Supplying market access for SHFs through facilitation of forward delivery contracts between private sector purchasers and farmer organizations; 7) Promotion of pro-SHFs procurement and widening of markets for SHFs by purchasing maize meal and beans through local and regional buyers; 8) Collaboration with superintendent agencies for food inspection and quality testing; 9) Advocating for SHF integration through agricultural working groups; and 10) Drafting a strategy for sustainable market access for SHFs and increasing procurement by national traders and institutional suppliers.

There were 16 SHF cooperatives in the four regions covered by the LRP project. At end line, an estimated 5,617 farmers directly benefited from participation in the LRP project, which accounts for roughly 10% of all farmers in the project regions. These SHFs and their cooperatives received benefits from capacity building efforts and direct support which included costs related to the management of the LRP project. Given the LRP project's significant reach with regards to SHFs, it provides a notable case study in the impact of LRP on local, regional, and national agricultural systems.

Data collected for the LRP project baseline and end line reports in Rwanda suggests that the program's focus on agriculture and the promotion of staple commodities were relevant for the region. Specifically, at the district-level, the LRP project's focus on land use consolidation, increased use of agricultural inputs, private sector involvement, farmer capacity strengthening, improved post-harvest facilities, and increased productivity and production aligned with areas of importance to district administrators. Furthermore, the LRP project was found to have a significant impact on the success of SHF cooperatives in the country. The capacity of SHF cooperatives to sustain themselves increased across the board because of the program. The end line survey showed that 100% of SHF cooperative members paid dues to their cooperative relative to approximately 64% at baseline. There was a significant degree of variance in cooperatives' capacities to continue operating, however, with certain cooperatives remaining in a fragile state even after the LRP project's completion. The governance structure of SHF cooperatives was generally strong, with increases in interest and participation of cooperative members after the program's completion. Cooperative organizations were found to have a clearer business structure at end line relative to baseline, suggesting that the LRP project's efforts helped to improve the business

practices of SHF cooperatives in the four regions. Production and sales of SHF cooperatives increased over the LRP project period. At end line, more than 58% of the cooperatives studied considered themselves to be more active than before the LRP project began. While improved, cooperatives' abilities to organize and manage their activities remained low in some cases, specifically with regard to accounting and business planning practices.

Furthermore, while cooperatives' access to capital increased over the LRP project period, their relatively low level of access and aversion to credit represented a major limitation to their continued success. One of the primary achievements of the LRP project in Rwanda related to SHF cooperatives is the improved connection of cooperatives and FTMA buyers. This strengthened connection had a notable impact on the production, post-harvest agricultural practices, and sales of cooperatives. However, cooperatives were found to rely on the LRP project to maintain their connection with FTMA buyers. This reliance brings the sustainability of the LRP project's impact on local agricultural producer-to-buyer connections into question, highlighting the need for further study of the LRP project's long-term impacts in this capacity.

The LRP project was also found to have significant impacts on SHF training and knowledge. In cooperation with the LRP project, SHF training was provided by RWARRI field officers. These trainings included GAP and PHHS. The primary goal of GAP training was to improve SHFs' skills in maize production including how to select the right crop variety for their land, planting timing, proper agricultural input usage, and crop spacing. PHHS training focused on the proper use of post-harvest equipment to improve commodity quality and safety. During the LRP project period, 4,230 SHFs received GAP training from RWARRI officers and 5,310 were trained in PHHS practices. These numbers correspond to 89.9% of SHF cooperative members being trained in GAP and 96% receiving PHHS training. Additionally, the end line report identified a roughly 17% increase in the number of SHFs with an excellent score on PHHS skills. With regards to the training of SHFs in best agricultural production and processing methods, the LRP project proved extremely effective. The primary practices adopted by SHFs at the end line of the LRP project included planting crops in rows, increased use of organic and chemical fertilizer combinations, improved cob sorting, and increased avoidance of grain contamination. Alternatively, some practices including fertilizer dosage, protective equipment usage, and hermetically sealed storage containers were adopted less frequently due to input costs. More farmers planted maize as a result of the project and input investments were seen as a higher priority than before the project began. With regards to SHFs' access to market information and credit, the end line report indicates that farmers had a better awareness of the Rwandan government's floor price and quality specifications of primary buyer groups, but few farmers understood the minimum commodity price needed to generate a profit on their harvest. Cooperatives and SHFs were found to be reliant on the LRP project to provide market information. Furthermore, SHFs' utilization of credit at end line remained unchanged relative to the baseline.

Another goal of the LRP project in Rwanda was to create new market opportunities for SHFs. Rwanda is a net importer of maize, and all domestic maize production comes from SHFs. Additionally, the buyer sector for maize is largely dominated by a small number of relatively large local buyers and agro-processors. All these buyer groups are part of the FTMA group that the LRP project supported access to among SHF cooperatives. At baseline, the report found that while buyer groups purchased commodities from SHF cooperatives, they were seen as unreliable trade partners who were only capable of delivering relatively small quantities of lower quality product. At end line, however, the three buyer groups included in the report's data stated that the LRP project had a positive impact on SHF cooperatives with buyers purchasing a larger share of their commodities from cooperatives. Furthermore, at end line buyers stated that: 1) Cooperative mentality had changed and cooperatives performed in a much more business-oriented manner; 2) There was a greater degree of trust and fewer instances of conflict between SHF cooperatives and buyer groups; 3) Cooperatives were able to deliver a greater aggregate quantity of commodities; 4) The quality of commodities delivered by SHF cooperatives increased and fewer orders had to be rejected based on quality. Several SHF cooperatives also signed contracts with agricultural buyer groups as a result of the LRP project. On average, cooperatives delivered between 117% and 89.9% of their contracted commodity amounts. While promising, these contracts between SHF cooperatives and buyer groups were seen as fragile by buyers and the number of contracts varied significantly across years. From the SHF cooperatives' perspective, the contracts with buyer groups were deemed satisfactory at end line. Buyer groups participating in the LRP project were able to adapt and facilitate contracts to

meet the constraints of individual SHF cooperatives. The SHF cooperatives' choice of buyer to contract with was largely driven by the quantity of maize they were willing to purchase, payment delays, transportation organization, on-site quality evaluations, and offered commodity price. SHFs were also found to be extremely cash constrained in the short term, so contracts with significant payment delays were unacceptable. SHF cooperatives participating in the LRP project reported improved business operation and quality management skills, allowing them to more readily satisfy their contractual obligations with buyers. The LRP project highlights the importance of facilitating communication between SHF cooperatives and buyer groups. While these contracts remained fragile at end line, the improved status of cooperatives from a business standpoint combined with the increased number of successful contracts between cooperatives and buyer groups highlights the LRP project's capacity to improve market access for participating producers.

With regards to the LRP project's effect on SHFs' ability to produce high quality and culturally appropriate foods, the end line report found that SHF cooperatives reported an increase in food security of their farmers through improved production. Both male and female headed SHFs withheld a smaller quantity of maize for own consumption at project end line relative to baseline, indicating that SHFs were able to sell a greater share of their commodities. This change led to an increase in SHF income, which was used to purchase household necessities. All cooperatives in the end line study also reported that maize quality increased as a result of the LRP project and farmers placed a greater emphasis on commodity quality at end line compared to baseline. The increased focus on commodity quality was reflected in the decreased order rejection rates of buyers at end line. Additionally, farmers reported consuming more maize at end line, which they deemed as a culturally appropriate crop. Taken together, these results suggest that the increased maize production that occurred as a result of the LRP project benefited the food security of SHFs in addition to the commodity's usefulness in school meals.

Another goal of the LRP project was to increase SHF incomes. Given the short nature of the program, the report was not able to find a significant change in farmer income at end line. However, the end line data show that SHFs purchased lower quantities of maize and beans at end line, suggesting that SHFs required fewer expenditures to meet their own consumption needs. If the increased commodity production that occurred due to the LRP project was sufficient to satisfy a greater share of SHFs' consumption needs, this finding may suggest that farmers were able to spend more of their income on other necessities. Additionally, selling commodities to FTMA buyers was found to be more profitable than selling to middlemen, which was the norm for SHFs prior to the LRP project's introduction. The degree of price volatility remained relatively high, however, which hurt profitability. It will be important for future research to evaluate the programs' long-run impact on SHF incomes as LRP develops in the region.

Taken together, the results of the end line report suggest that the LRP project had a positive impact on Rwanda's agricultural sector. The LRP project's activities were well aligned with the Rwandan government's goals, making the project a suitable fit for identified areas of improvement. Like Burkina Faso and Kenya, SHF cooperatives experienced an improvement in their organizational and business practices, and the quantity and quality of commodities produced by SHFs increased as a result of the program. Additionally, SHFs gained improved access to buyer groups participating in the LRP project, highlighting LRP's capacity to facilitate new market connections. Buyer groups saw SHF cooperatives as a stronger business partner and cooperatives reported positive relationships with contracted buyers. However, these relationships were found to remain fragile in many cases, with heavy reliance on the LRP project to support trade. The fragility of these new relationships is a common trend in the LRP projects of our three countries. Additionally, more cooperatives and SHFs received training in GAP and PHHS, which may explain the increase in productivity identified at end line. There was also some evidence to suggest that SHFs were able to sell greater shares of their crops, potentially freeing up income for other vital uses. While beneficial, the LRP project's long-run effects are unclear. Future evaluation of the program's impacts on Rwanda's agricultural sector are needed to identify the sustainability of LRP's beneficial effects.

LRP Indicators

Performance monitoring is a key part of the USDA-FAS's implementation of results-oriented management. All MGD grant agreements must include a Performance Monitoring Plan (PMP) that identifies indicators for monitoring progress in achieving stated results and presents a strategy for collecting performance data. The PMP should include applicable standard indicators and custom (project-specific) indicators. Standard indicators are a common set of mandatory indicators identified by FAS that must be used by all MGD grant recipients, if applicable to the project. Applicants must use all applicable standard indicators in their PMPs. Custom indicators are additional project-specific performance indicators. In some cases, applicants may need to develop custom indicators when the FAS standard indicators alone do not adequately measure all of a project's planned activities or intended results. Once applicants have identified the set of relevant standard and custom indicators, they establish numbers for their indicator baselines and targets.

The LRP project has 16 standard indicators, which are listed in Table 2.3. Thirteen of the 16 indicators are

Table 2.3 LRP Standard Indicators, Type, and Baseline Values

NO.	INDICATOR	TYPE	BASELINE
1	Number of individuals participating in USDA food security programs	Output	0
2	Number of individuals benefiting indirectly from USDA-funded intervention	Output	0
3	Number of social assistance beneficiaries participating in productive safety nets as a result of USDA assistance	Output	0
4	Cost of transport, storage, and handling of commodity procured as a result of USDA assistance (by commodity)	Output	0
5	Cost of commodity procured as a result of USDA assistance (by commodity) and source country)	Output	0
6	Quantity of commodity procured (MT) as a result of USDA assistance (by commodity and source country)	Output	0
7	Value of anual sales of farms and firms receiving USDA assistance	Outcome	sales value in year prior to programming
8	Value of commodities sold by farms and firms receiving USDA assistance	Outcome	volume sold and reported as sales in Indicator 7
9	Total increase in installed storage capacity (dry or cold storage) as a result of USDA assistance	Output	0
10	Number of policies, regulations and/or administrative procedures in specified stages of development as a result of USDA assistance	Output (Stages 1,2), Outcome (Stages 3, 4, 5)	0 0
11	Number of individuals who have received short-term agricultural sector productivity or food security training as a result of USDA assistance	Output	0
12	Number of individuals in the agriculture system who have applied improved management practices or technologies with USDA assistance	Outcome	number of participant producers and other actors applying improved management practices or technologies promoted by activity at start of activity
13	Number of trained in disaster preparedness as a result of USDA assistance	Output	0
14	Number of public-private partnerships formed as a result of USDA assistance	Output	0
15	Value of new USG commitments and new public and private sector investments leveraged by USDA to support food security and nutrition	Output	0
16	Number of schools reached as a result of USDA assistance	Output	0

"output" indicators, that is, indicators that measure or quantify the products, goods, or services which directly result from implementation of programmatic activities. Three indicators are "outcome" activities, which include indicators measuring the intermediate effects of a project activity or set of activities. Outcome indicators directly relate to output indicators. All output indicators have a baseline value of zero, implying that they do not measure the impact of project activities relative to their pre-existing performance level before project activities have begun. Rather, these indicators simply measure project outputs rather than the program's added value. In other words, there can be no measurable negative impacts associated with the set of output indicators since they are not measured relative to changes from a pre-project baseline. The three outcome indicators, #7, #8, and #12, do include non-zero baselines, however, relating to participating farms' prior-year sales volumes and values. They use advanced management practices or technologies. Thus, these outcome indicators can provide a measure of the program's added value relative to pre-project performance. Kenya did not use Indicator #9, Burkina Faso did not

Table 2.4 Custom Indicators Used by Burkina Faso and Rwanda (Kenya Used Only Standard Indicators.)

NO.	CUSTOM INDICATOR - BURKINA FASO	BASELINE
1	Number of local government staff and COGES trained in commodities managment: procurement, delivery storage, and distribution	0
2	Cost of commodity delivery as a result of USDA assistance (by commodity and source country)	0
3	Cost of commodity distribution as a result of USDA assistance (by commodity and source country)	0
4	Percent of schools that receive timely food assistance according to criteria (date delivery, quantity and quality)	10
5	Percent of commune and COGES implement their procurement plans as planned	10
6	Percent of producer organizations that comply with contracted delivery criteria (dates, quantity and quality)	20
7	Percent of commune with timely food distribution at school level	20
8	Percent of schools with culturally acceptable foods that meet quality standards	0
9	Percent of children that report eating culturally acceptable foods at school	0
10	Number of school-age children receiving daily school meals (breakfast, snack, lunch) as a result of USDA assistance	0
11	Average student attendance rate in USDA supported classrooms/schools	65
12	Number of daily school meals (breakfast, snack, lunch) provided to school-age children as a result of Government of USDA assistance	0
13	Number of daily school meals (breakfast, snack, lunch) provided to school-age children as a result of Government of Burkina Faso assistance	0
14	Number of daily school meals (breakfast, snack, lunch) provided to school-age children as a result of community assistance	0
15	Number of farmer groups receiving dehulling machines Percent	0
16	Percent of producer groups that sold millet, cowpea, or rice to a new buyer as a result of USDA assistance	0
17	Percentage of product sales transacted by new contracts	0
NO.	**CUSTOM INDICATOR - RWANDA**	**BASELINE**
1	Percentage of default rate of WFP pro-smallholder farmer procurement contracts, disaggregated by reason and aggregation system	not reported
2	Number of USDA-supported aggregation systems that have access to credit from formal financial institutions	not reported
3	Percentage of milling facility operators who demonstrate proper application of technologies and practices as a result of USDA assistance	not reported
4	Percent of farmers that apply improved post-harvest practices as a result of USDA assistance	not reported

use Indicator #10, none of the three countries used Indicators #12 and #13, and Kenya and Rwanda did not use Indicator #16. Burkina Faso and Rwanda's projects also relied on custom indicators. These are reported in Table 2.4. Rwanda had four custom indicators, whereas Burkina Faso had 17. Baseline values were not reported for any of Rwanda's indicators (standard or custom).

Figures 2.2-2.5 report the semi-annual LRP Standard Indicator Performance metrics for Burkina Faso, Kenya, and Rwanda. Cases of missing data are left blank. These figures are provided to show the original data provided on a semi-annual basis. Interpretation is reserved for subsequent figures that aggregated data into annual measurements.

Figure 2.2 Semi-annual LRP Indicator Performance Metrics for Burkina Faso, Kenya, and Rwanda (Indicators 1-4)

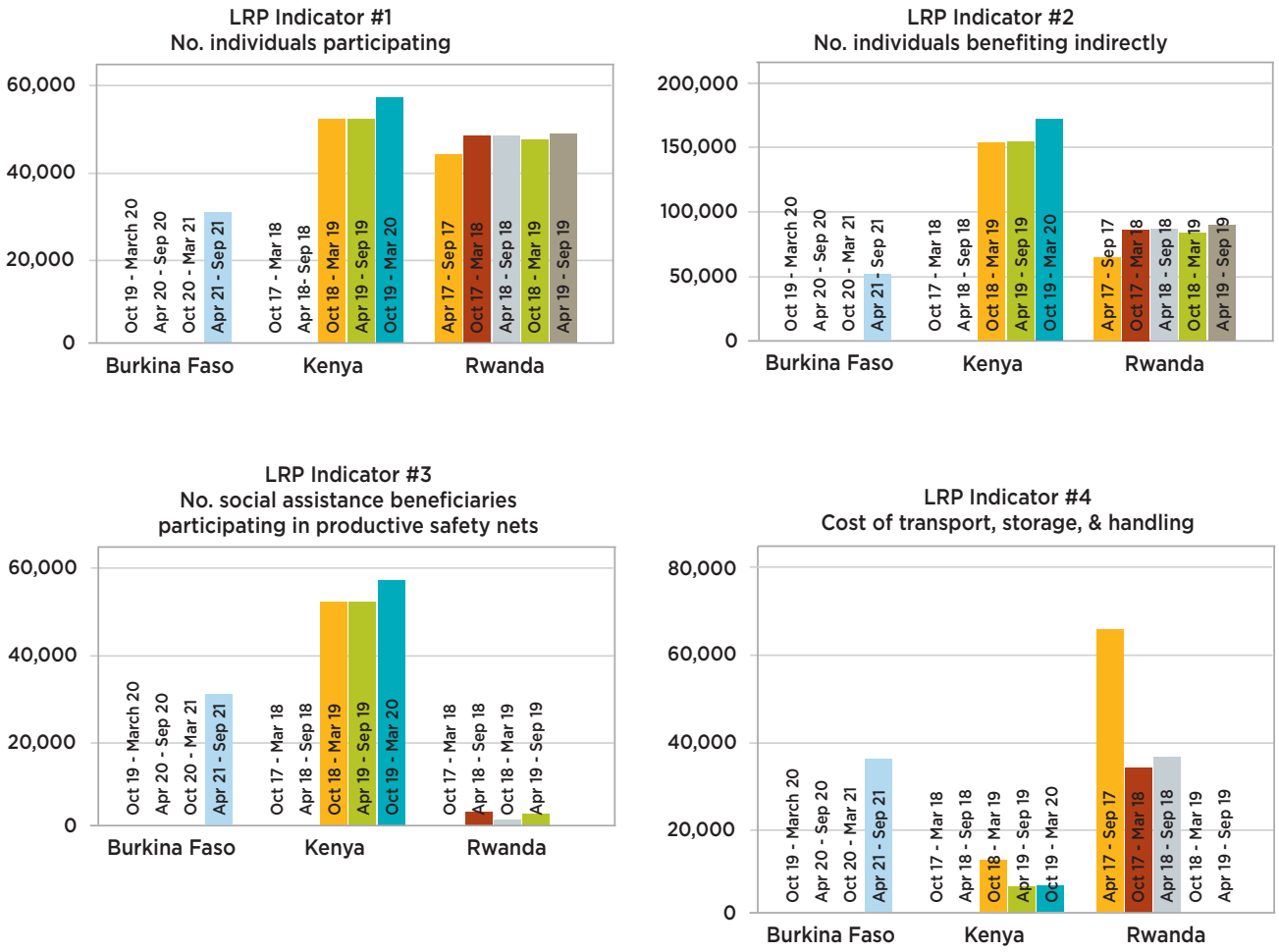


Figure 2.3 Semi-annual LRP Indicator Performance Metrics for Burkina Faso, Kenya, and Rwanda (Indicators 5-8)

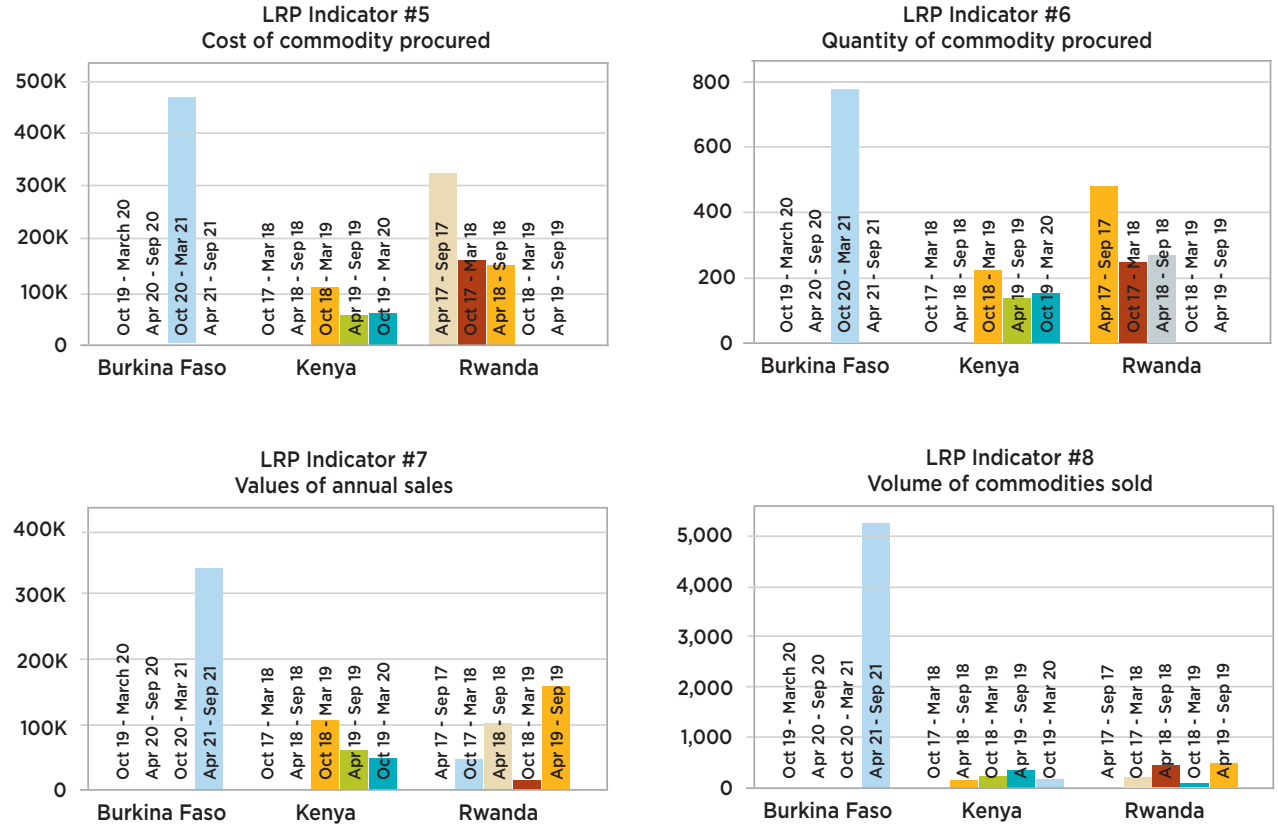
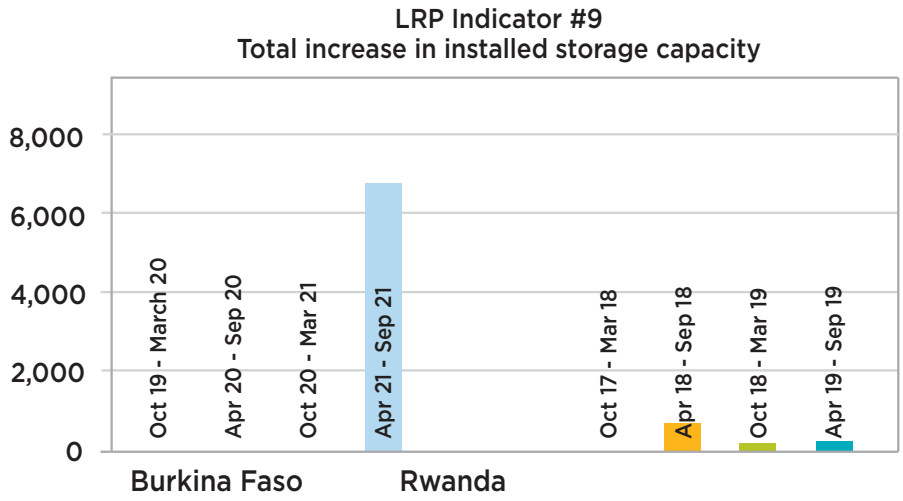
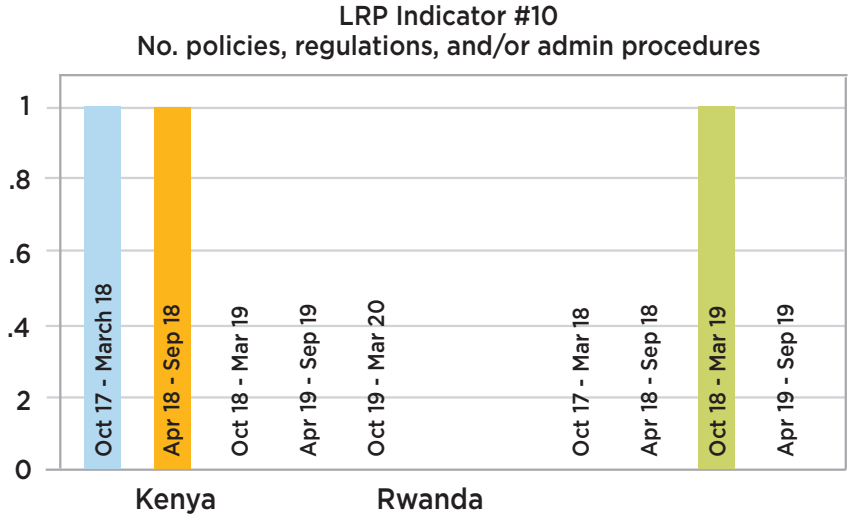


Figure 2.4. Semi-annual LRP Indicator Performance Metrics for Burkina Faso, Kenya, and Rwanda (Indicators 9-11).





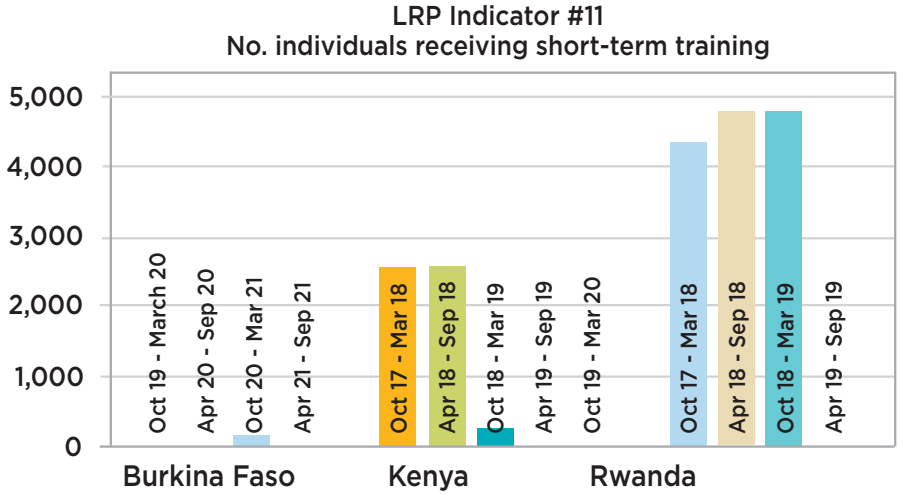
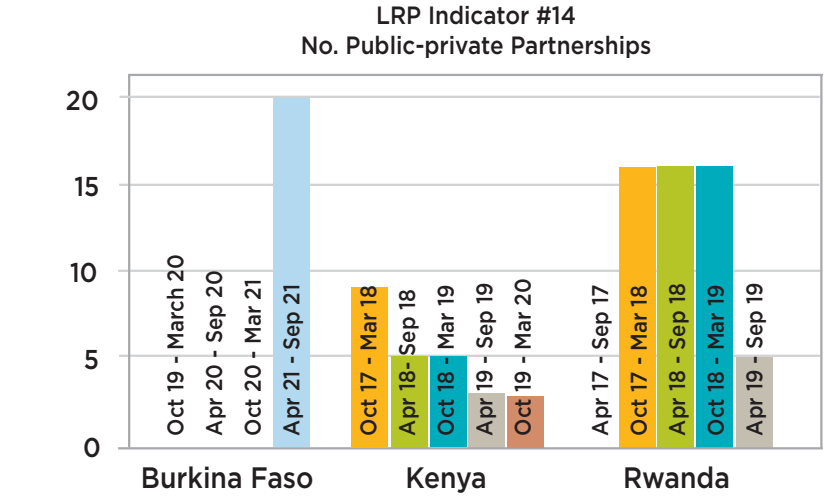
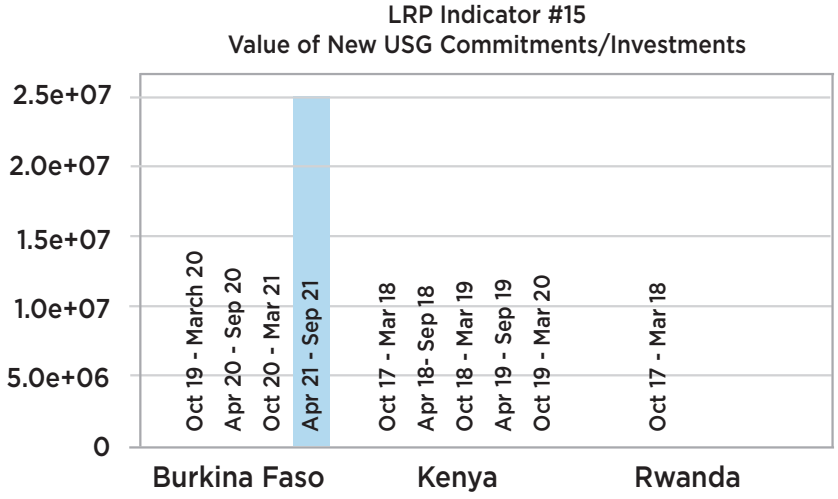
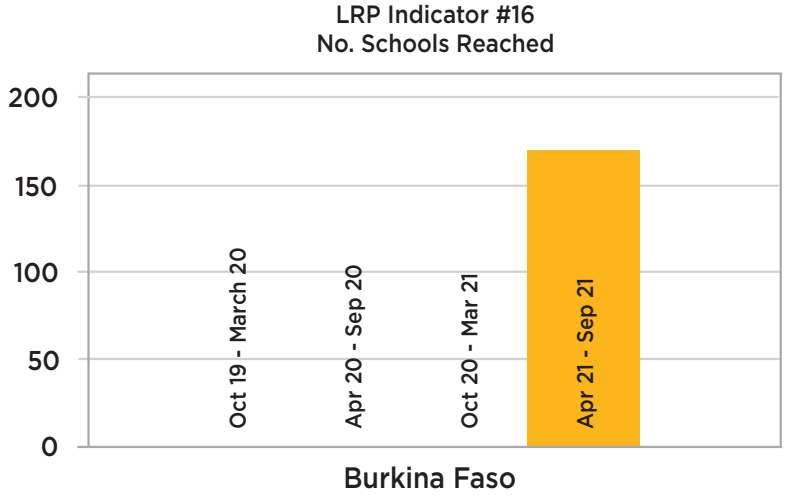


Figure 2.5 Semi-annual LRP Indicator Performance Metrics for Burkina Faso, Kenya, and Rwanda (Indicators 14-16)

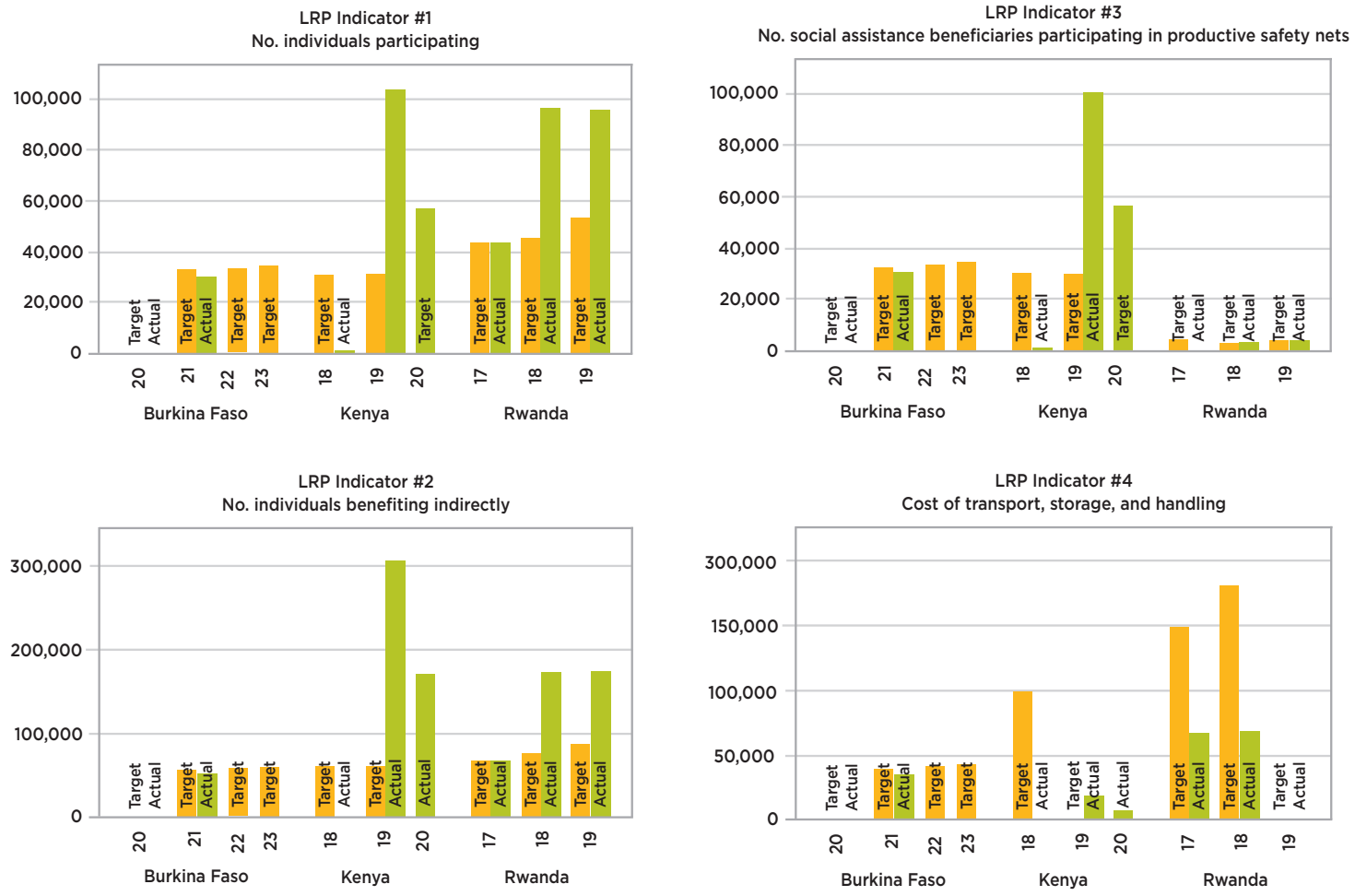






Figures 2.6-2.9 report the aggregated fiscal year performance metrics compared to the fiscal year targets. The number of individuals participating generally exceeded targets; the number of individuals benefiting indirectly also generally exceeded targets; the number of social assistance beneficiaries was generally at the level of their targets in Burkina Faso and Rwanda and exceeded targets in Kenya; and the cost of transport, storage, and handling was generally below targets for Rwanda, at or near targets for Burkina Faso, and mixed for Kenya (Figure 2.6).

Figure 2.6 Fiscal Year Target and Actual LRP Indicator Performance Metrics for Burkina Faso, Kenya, and Rwanda (Indicators 1-4)



The actual cost of commodities procured was mixed relative to project targets; the quantity of commodities procured was generally at or near project targets, being slightly above targets for Burkina Faso and Kenya, and slightly below targets for Rwanda; the values of annual sales were generally greater than the targets, with one exception in Rwanda (FY 2018); the volume of commodities sold were either at or near targets, with the exception of Burkina Faso (FY 2021), where actual greatly exceeded target (Figure 2.7).

The total increase in installed storage capacity was initially below target in Burkina Faso in FY 2020, but then more than made up for it in FY 2021, whereas actuals were at or near targets in Rwanda; the number of policies, regulations, and administrative procedures is mixed; and the number of individuals receiving short-term training was slightly below target in Burkina Faso, but above targets in Kenya and Rwanda (Figure 2.8).

The number of public-private partnerships was below target in Burkina Faso and Kenya, but at or near targets in Rwanda; the value of new USG commitments/investments greatly exceeded the target in Burkina Faso, but was below targets for Kenya, with Rwanda having zero for both targets and actuals; the number of schools reached was slightly below target for Burkina Faso (Figure 2.9).

Figure 2.7 Fiscal Year Target and Actual LRP Indicator Performance Metrics for Burkina Faso, Kenya, and Rwanda (Indicators 5-8)

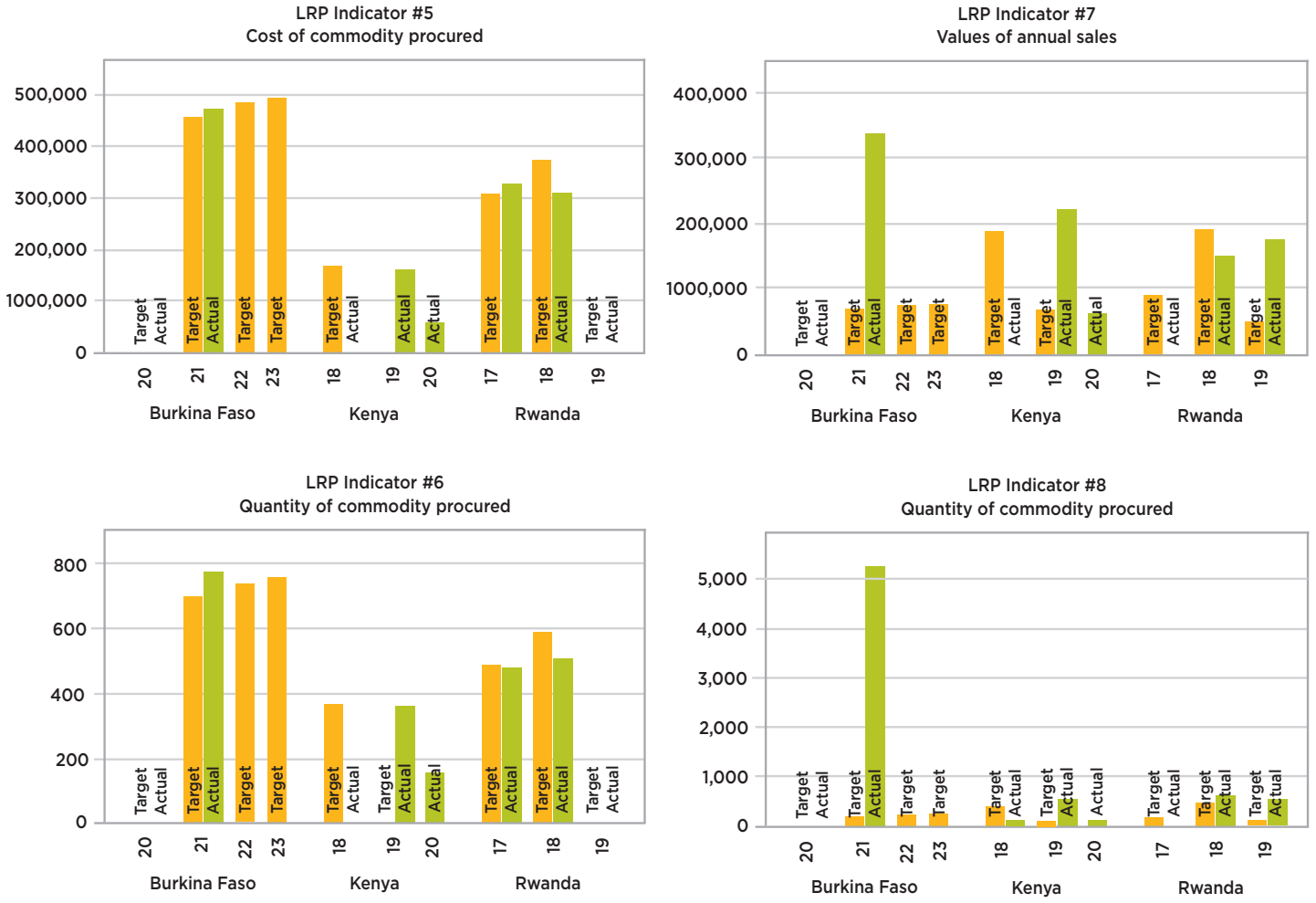
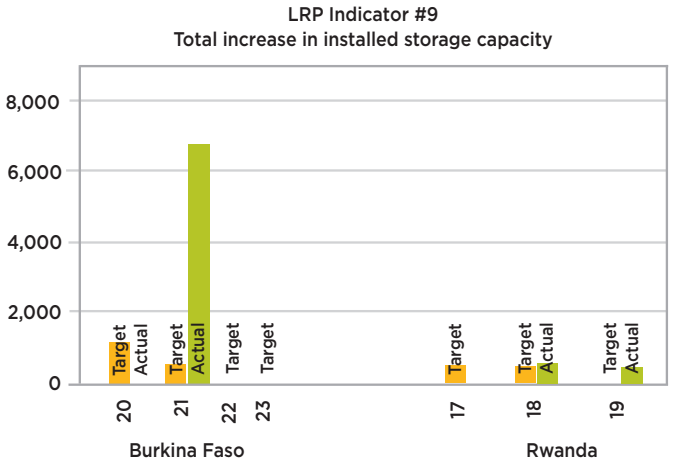
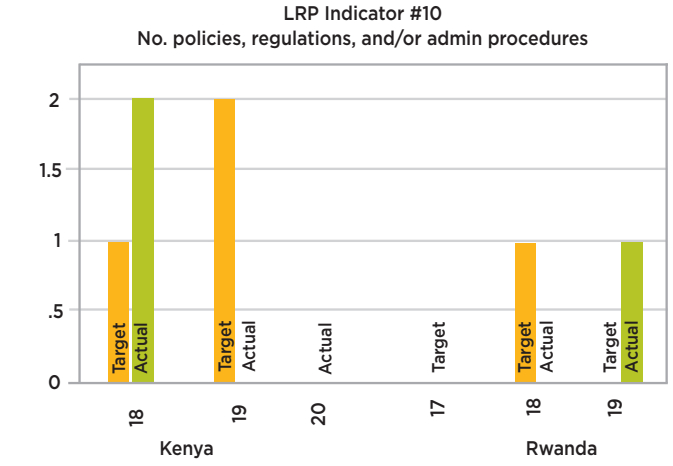


Figure 2.8 Fiscal Year Target and Actual LRP Indicator Performance Metrics for Burkina Faso, Kenya, and Rwanda (Indicators 9-11)





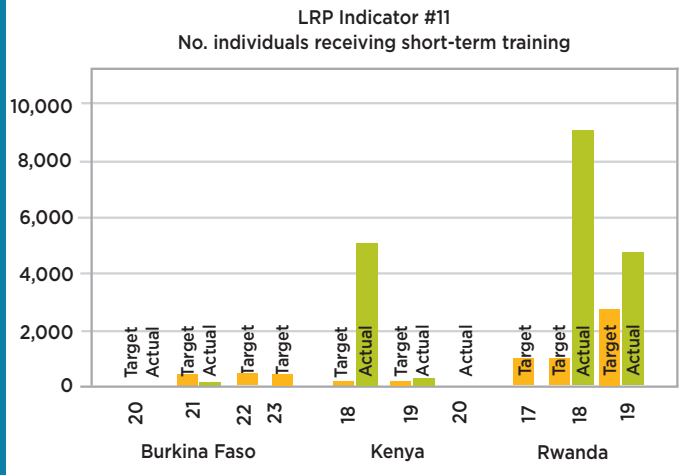
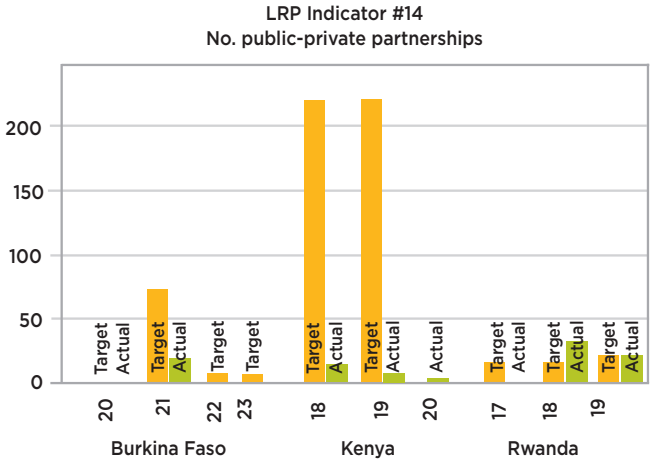
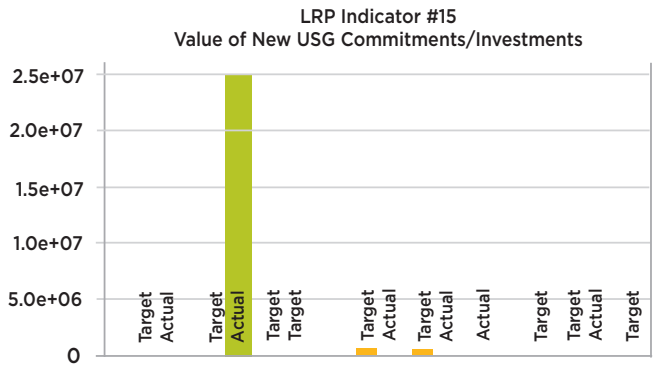
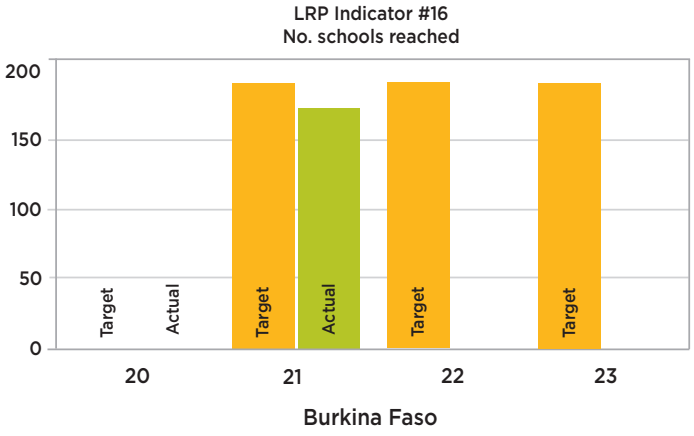


Figure 2.9 Fiscal Year Target and Actual LRP Indicator Performance Metrics for Burkina Faso, Kenya, and Rwanda (Indicators 14-16)







Summarizing the above data, ignoring cases where data are missing or the target metric is zero, we find that, across all standard indicators, performance targets are slightly more likely to be met or exceeded (N = 34) relative to being below target (N = 28) (Table 2.5).

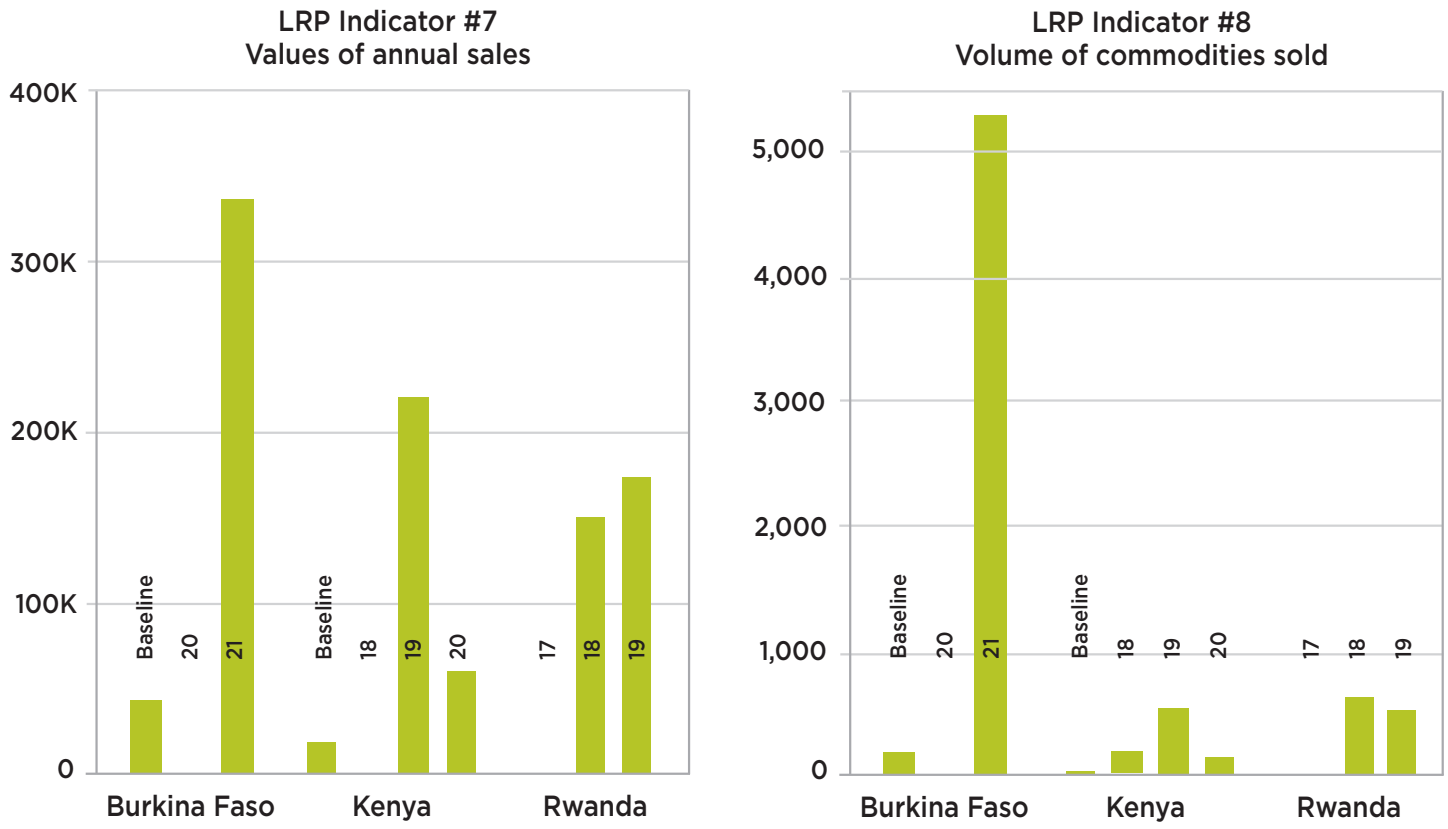
Indicators #7, #8, and #12 are the only LRP Standard Indicators with non-zero baselines. Figure 2.10 reports baselines against fiscal year actual performance metrics. Baseline data were missing for Rwanda. In all cases (N = 4), the baseline was eventually exceeded in subsequent years, implying an added value of the program.

Table 2.5 Count of Instances that FY Actual Performance Metric is Greater Than, Equal To, or Less Than Target Metric.

Indicator	Actual ≥ Target	Actual < Target
1	4	2
2	3	3
3	3	2
*4**	*4*	*0*
*5**	*2*	*2*
6	1	3
7	3	3
8	4	2
9	2	1
10	1	2
11	4	1
14	2	4
15	1	2
16	0	1
TOTAL	**34**	**28**

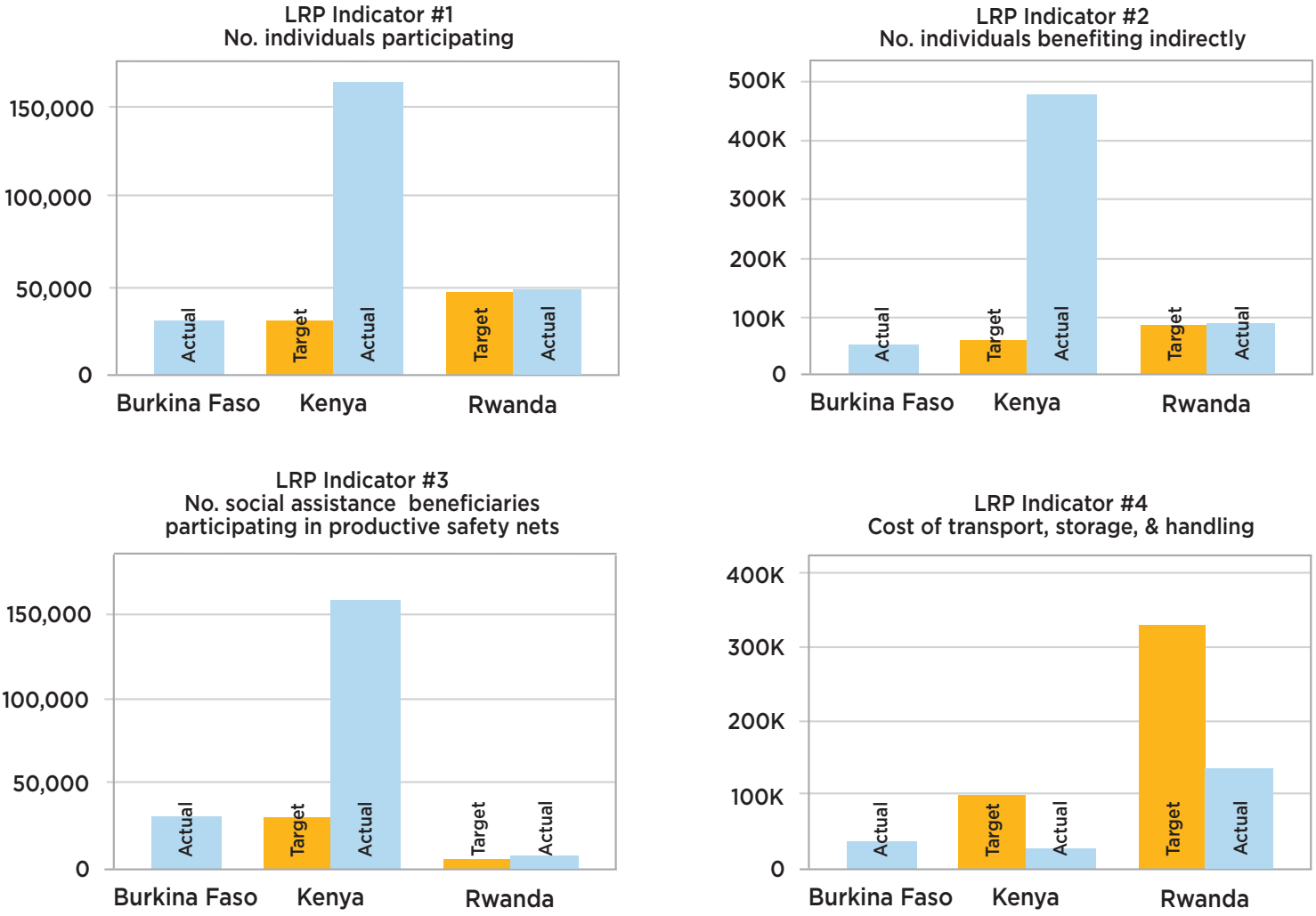
*Indicators are measured as costs, so actual costs below targets are preferred, so we switch vlues in the columns to e consistent with other indicators.

Figure 2.10 Baseline and Fiscal Year Actual LRP Indicator Performance Metrics for Burkina Faso, Kenya, and Rwanda (Indicators 7-8)



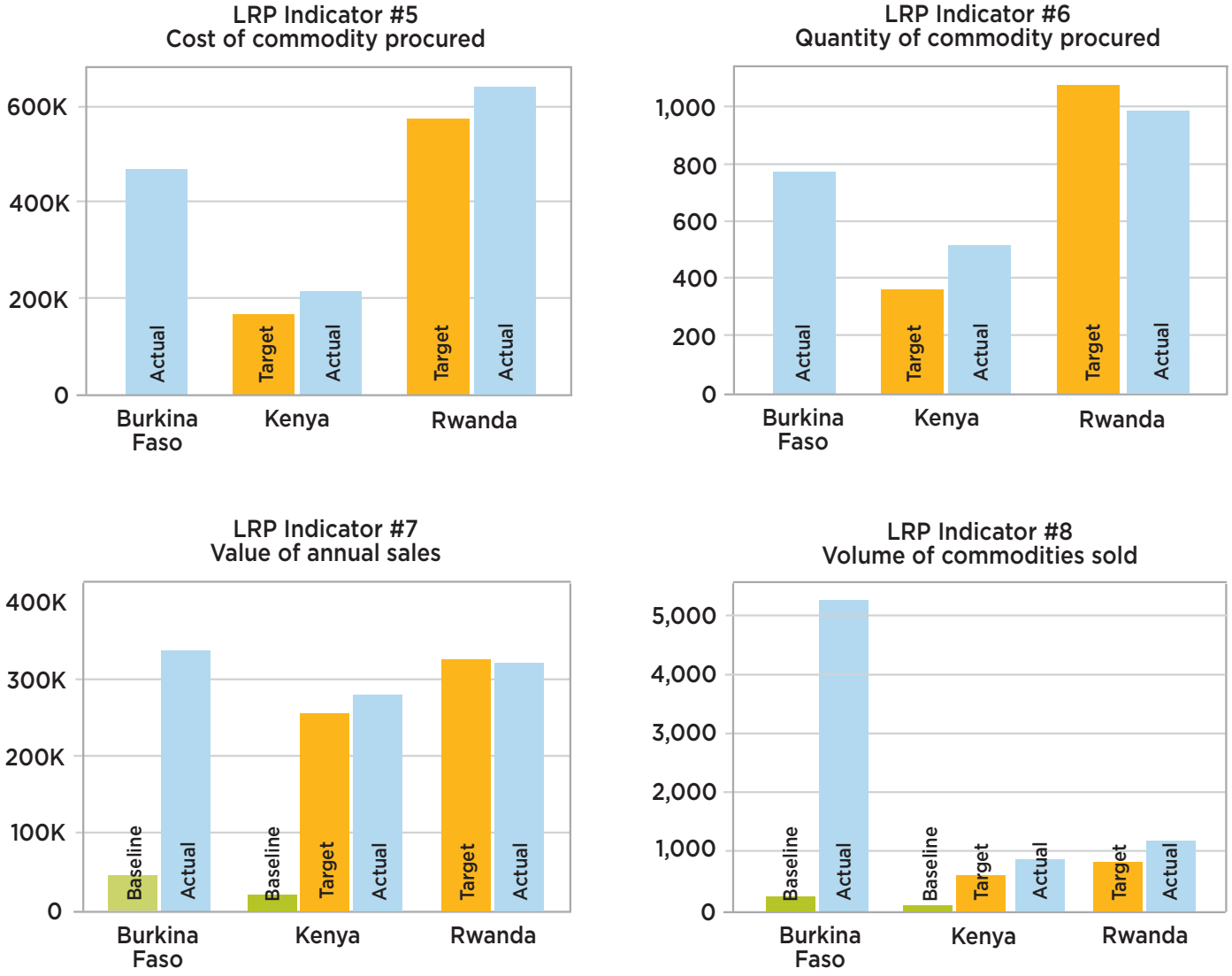
Figures 2.11-2.14 report project life target and actual performance metrics. Target data were missing for Burkina Faso. Over the life of the project, the actual number of individuals participating exceeded the target in Kenya and was just slightly above target for Rwanda; the number of individuals benefiting indirectly exceed the target in Kenya and was nearly equal to the target in Rwanda; the number of social assistance beneficiaries exceeded the target in Kenya and just slightly exceeded the target in Rwanda; the cost of transportation, storage, and handling was below target for both Kenya and Rwanda (Figure 2.11).

Figure 2.11. Project Life Target and Actual LRP Indicator Performance Metrics for Burkina Faso, Kenya, and Rwanda (Indicators 1-4).



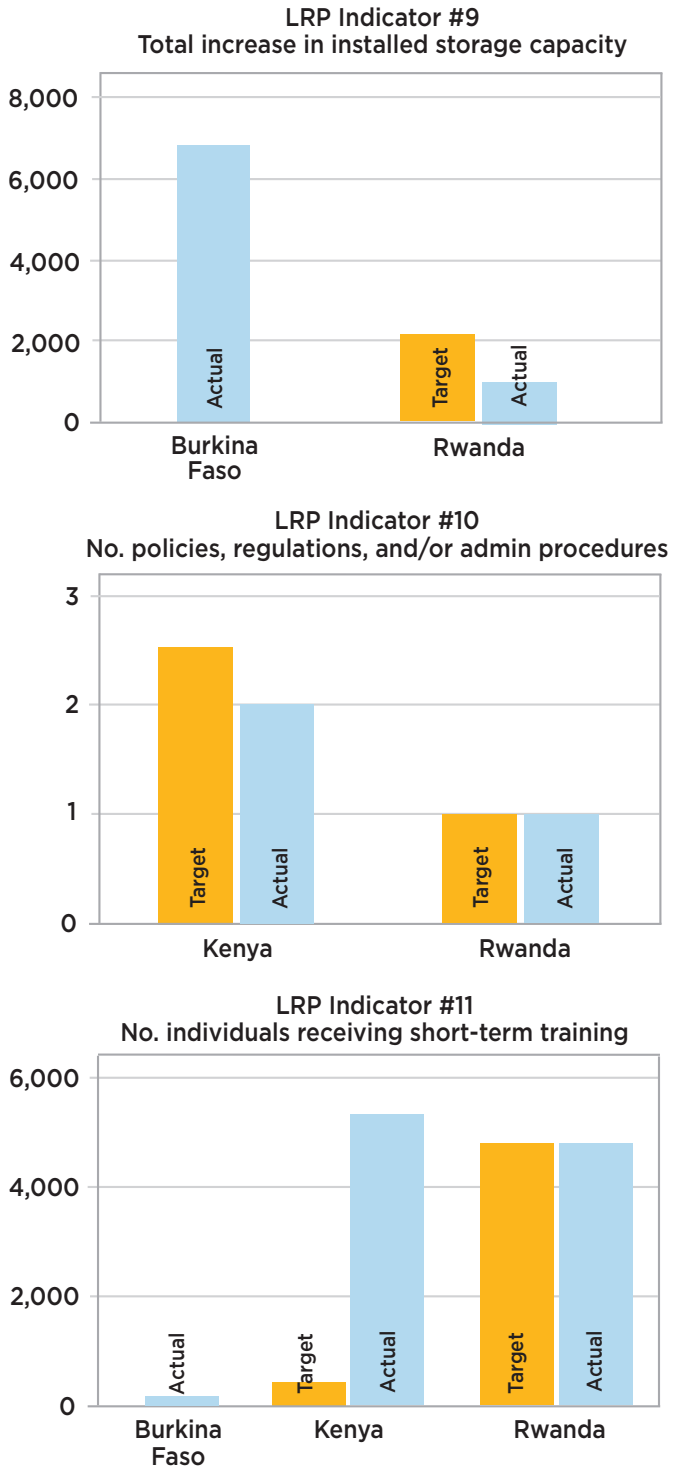
The actual cost of commodities procured was above target for both Kenya and Rwanda; the quantity of commodities procured was above target for Kenya but below target for Rwanda; the value of sales, one of the few indicators with a non-zero baseline, increased during the life of the project for Burkina Faso and Kenya (baseline data not available for Rwanda), with the actual value also exceeding the target in Kenya, but coming up just short of the target in Rwanda; the volume of commodities sold increased relative to the baseline in Burkina Faso and Kenya, with actual volumes exceeding the targets in both Kenya and Rwanda (Figure 2.12).

Figure 2.12 Project Life Target and Actual LRP Indicator Performance Metrics for Burkina Faso, Kenya, and Rwanda (Indicators 5-8).



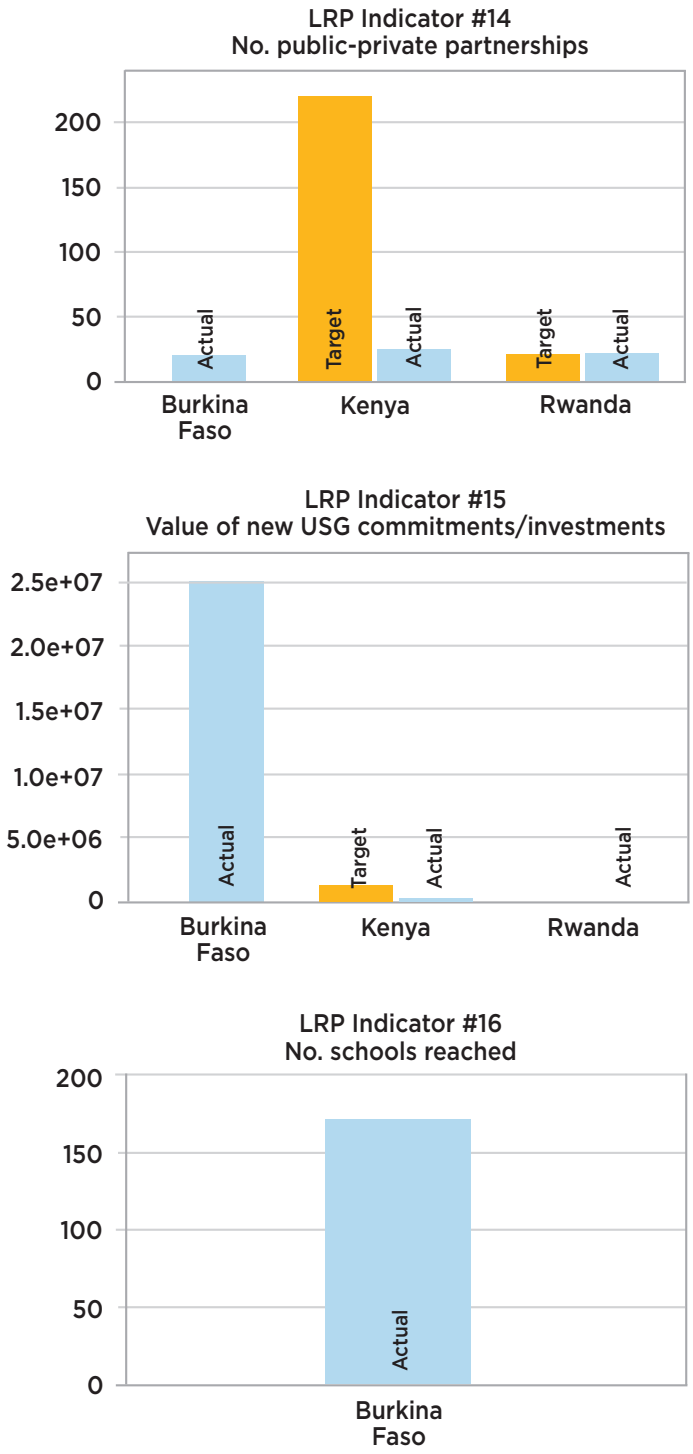
The actual total increase in installed storage capacity was right at the target level in Rwanda; the number of policies, regulations, and administrative procedures was below the target for Kenya and right at the target for Rwanda; the number of individuals receiving short-term training exceeded the target in Kenya and met the target in Rwanda (Figure 2.13).

Figure 2.13 Project Life Target and Actual LRP Indicator Performance Metrics for Burkina Faso, Kenya, and Rwanda (Indicators 9-11).



The number of public-private partnerships was short of the target in Kenya and met the target in Rwanda; the value of new USG commitments/ investments was below target for Kenya (target data were missing for Rwanda); no target data were available for the number of schools reached (Figure 2.14).

Figure 2.14. Project Life Target and Actual LRP Indicator Performance Metrics for Burkina Faso, Kenya, and Rwanda (Indicators 14-16).



Summarizing the above data, ignoring cases where data are missing or the target metric is zero, we find that, across all standard indicators, performance targets were met or exceeded 17 out of 24 times (Table 2.6).

Table 2.6. Count of Instances that Project-Life Actual Performance Metric is Greater Than, Equal To, or Less Than Target Metric.

Indicator	Actual ≥ Target	Actual < Target
1	2	0
2	2	0
3	2	0
*4**	*2*	*0*
*5**	*0*	*2*
6	1	1
7	1	1
8	2	0
9	1	0
10	1	1
11	2	0
14	1	1
15	0	1
16	-	-
TOTAL	17	7

**Indicators are measured as costs, so actual costs below targets are preferred, so we switch values in the columns to be consistent with other indicators.*

Discussion

Performance Data

In summary, we find that, across all standard indicators, individual-year performance targets are nearly equally likely to be met or exceeded relative to be below target (55% of the time they are met or exceed), but that over the full project lifetime, performance targets are met or exceeded 71% of the time. This implies that projects that may have some delays from year to year appear to be able to compensate in other years to meet project targets successfully.

Data Issues

Evaluation Data

- Evaluation surveys contain an abundance of data, but much of it is not readily useful because of a lack of pre- or post-project conditions.
- Many survey questions/responses are not relevant to gain insight into project impacts on say, local agricultural production, markets, etc. We recognize that these surveys are likely designed for other purposes.
- Performance Data
- Baseline data are missing from the available material for Rwanda's FY 2016 LRP project, and MSU was informed that these data are likely not recoverable. The explanation given is that it is likely that the PVO forgot to update FAIS, and the analysts covering the project at the time did not notice the error.
- Burkina Faso's "Life of Project" values were missing.
- Three of the 17 standard indicators (#7, #8, #12) have non-zero baselines, which allow for insights into the extent to which LRP activities improved pre-project conditions. But none of our three case-study countries used #12 ("Number of individuals in the agriculture system who have applied improved management practices or technologies with USDA assistance"), and Rwanda provided no baseline values for any indicators, leaving almost no basis for analysis in this regard.
- Standard Indicator #1 is described in the Indicator Handbook as "Number of individuals participating in USDA food security programs." However, in Kenya and Rwanda's semi-annual performance report tables, it is described as "Number of individuals benefiting directly from USDA-funded intervention. This may be a minor issue but does present the possibility of misinterpretation and mismeasurement for this indicator.
- Kenya's performance reports appear to have some conflicting data. In most cases, the values match across tables, though the indicators are in a different order. Indicator data are reported in two separate tables, "Activities" and "Results".
    - In the "FY18 Second Half" performance report Excel file, for the period April-September 2018, Standard Indicator #11, Table 1 ("Achievements") reports a value of 300, but Table 2 ("Result Outcomes") reports a value of 2,535.
- In Rwanda's report, indicators are mis-numbered.

Cash Transfers

- Cash transfers are not allowed under LRP (personal communication with USDA-FAS Staff, 2/4/22), yet they are cited as having been used in LRP Reports to Congress:
    - FY 2018 LRP Report to Congress, p. 5 (Laos)
    - FY 2019 LRP Report to Congress, p. 2 (Cambodia)
    - FY 2020 LRP Report to Congress, p. 6 (Cambodia)

It may be that these cash transfers were made using separate funding, but as written, it gives the impression that they were in fact made using LRP funds.

Recommendations to Improve Future Research Efforts

- Standardization of reports and timely inspection by USDA personnel for completeness. For example, each semi-annual performance report (Excel spreadsheet) is in a different format; in some, indicators are numbered, but not in others; indicators are in different orders; in Rwanda's report, indicators are misnumbered. Kenya's report separates the values into two tables, much of which appears to be redundant, but in some cases has conflicting values across tables. Rwanda's baseline values are missing entirely. Burkina Faso's "Life of Project" values are missing.
- In the long-term, it may be beneficial to have more indicators with non-zero baselines so that a project's impact on the pre-project conditions can be better ascertained.

Conclusion

The Agricultural Improvement Act of 2018 revised the MGD, authorizing that no more than 10% of MGD program project funds go towards the procurement of LRP commodities. Starting in FY 2020-2021, all new MGD project grants are required to include an LRP component, highlighting the developing importance of LRP. Broadly speaking, LRP project activities include improving and increasing procurement of locally grown agricultural commodities to supplement and improve school feeding programs, strengthening local agricultural capacity and capabilities, training local farmers, and providing valuable market information to local producer and buyer groups.

Since 2010, there has been a 200% increase in LRP project expenditures. Currently, LRP project expenditures represent a significant share of total MGD spending. During FYs 2016-2019, an estimated 300,000 individuals benefited from the LRP project. In light of LRP's growing role in the MGD program and its potential impacts, understanding the effects of LRP efforts on local agricultural sectors is paramount to evaluating program success.

Since the initial introduction of LRP into the MGD program, the LRP project has taken various forms in various countries to meet specific country needs. For example, the LRP project of some countries focus more on increasing the productivity of SHFs while others are oriented more towards the establishment of agricultural producer/buyer group networks. While LRP projects are not standardized across countries, existing research suggests that LRP, and similarly, HGSF can be more efficient than alternative modalities in terms of both cost and delivery time. The programs are also estimated to be less likely to harm local markets than programs that rely more heavily on international commodities. LRP is not, however, a perfect solution. Existing research has shown that LRP projects lead to concerns regarding food safety and quality which are highly variable across countries. Local procurement could therefore increase the delivery of unsafe or low-quality foods which we observe in our case study of Burkina Faso. Similarly, in local markets with limited capacity, a greater reliance on local foods can drive up prices and increase price volatility.

Given the findings of previous research, understanding the impact of LRP projects operating through the MGD on school feeding programs and local agricultural sector outcomes is crucial to improving future LRP project design and building our understanding of LRP's greater effects.

To analyze the performance and effects of LRP, we conducted a case study of three African countries: Burkina Faso, Kenya, and Rwanda. These three countries represent valuable case studies on the effects of LRP under the MGD with the structure and goals of the programs varying across countries and time. By analyzing these countries of interest, we identified the various outcomes and limitations of each LRP project, providing results which can serve to inform future LRP programmatic efforts.

One of the primary goals shared across the LRP projects in Burkina Faso, Kenya, and Rwanda was improving the cost-effectiveness and timeliness of school food provisions. In theory, by supplementing international commodities with locally produced foods, school feeding programs have the capacity to provide meals at a lower cost with less delays in delivery of foods to schools. From baseline reports, we found that the local agricultural systems of each country were largely capable of satisfying LRP project commodity needs. While issues in each country prevented a thorough analysis of cost effectiveness, we found notable issues with the quality and timely delivery of LRP commodities to schools in each of the three countries consistent with the results of existing research. Generally, these issues were the result of slow internal systems of quality control and transportation which limited the ability of LRP projects to deliver commodities in a timely manner. In Burkina Faso, for example, we found that most deliveries to canteens were late, and a significant amount of commodity stocks were lost due to prolonged storage in inadequate facilities. The delivered commodities were also of lower quality than anticipated due to their prolonged storage. Additionally, countries in our case study illustrated the importance of climate and weather conditions to the efficiency and effectiveness of LRP projects. For example, we found that unanticipated weather events led to few LRP schools in Kenya receiving their pre-determined commodities. Therefore, since climate change may have short- and long-term effects on local weather conditions, we identify it as a significant threat to LRP project success, especially in arid climates and other areas highly susceptible to variations in climate.

Taken together, our analysis of the three countries suggests that while local agricultural systems may have the capacity to produce enough commodities

to satisfy LRP projects, limitations to transportation, quality control, and climate resilience may lead to an insufficient provision of food to schools. Therefore, identifying and addressing these potential limiting factors through project efforts is vital for the successful design and implementation of future LRP projects.

While each of the three LRP projects included in our analysis faced challenges, we found evidence of significant benefits. The most readily apparent benefits of LRP projects identified in our case studies were to the countries' local agricultural sectors. All three LRP projects considered in our analysis targeted improving the capacity of SHFs and local cooperatives. In each country, there is evidence to suggest that the programs successfully increased the capacity of SHFs through training, direct purchases/contracts, and the facilitation of proper business practices. Furthermore, the capacity and performance of SHF cooperatives improved as a result of LRP, with improvements to cooperatives' organizational practices, and the quantity and quality of commodities produced. SHFs also gained improved access to buyer groups through the LRP projects, highlighting the capacity of LRP to build and facilitate new market connections. SHF cooperatives were viewed as stronger business partners by buyer groups, showing their newfound importance in the agricultural supply chain. These producer/buyer relationships were found to be tenuous in certain cases, however, suggesting that the sustainability of identified improvements may be limited. Additional research is needed to understand the long-term impacts of LRP projects on the capacity and efficiency of local agricultural systems.

To further explore the outcomes of LRP in Burkina Faso, Kenya, and Rwanda, we conducted an analysis of LRP indicator data provided through the MGD's PMP. Unfortunately, differences in available indicators and indicator structure across countries limited our ability to conduct rigorous cross-country analysis. Additionally, the limited number of indicators with non-zero baselines prevented us from evaluating the LRP projects' added value in each country compared to the pre-LRP period. Nevertheless, we were able to identify several key outcomes that provide valuable information regarding the programs' effects.

Compared to their targeted values, we found that across all standard indicators with available data, the three countries met their year-specific targets in 55 percent of cases. Performance was better across the projects' lifetimes, however, with 71 percent of final indicator values meeting or exceeding their targeted values. Taken together, our results suggest that there may be significant delays in effectiveness present in earlier years of the program. Given adequate time, however, the LRP projects were found to satisfy the majority of their goals. This finding highlights the importance of continually evaluating the performance of LRP projects across time to identify effectiveness as programs continue to develop. Therefore, while LRP projects may take some years to begin operating properly, they appear to achieve their goals, for the most part, by the end of their lifetime. If countries can continue to strengthen their LRP projects across time, the performance of later LRP project iterations will likely build on the activities conducted in earlier programmatic efforts. Therefore, comparing the results of new programs to older iterations of LRP within the same country would prove an effective way to identify prolonged effectiveness.

As mentioned previously, major limiting factors in our analyses were data availability and standardization. While the evaluation data include a number of variables, they were generally not suited for our analysis due to the lack of pre- or post-project conditions. Therefore, we were not able to evaluate the LRP projects' value added relative to a non-zero baseline. Additionally, many of the included questions were not suitable for assessing the impacts of LRP projects on local agricultural systems. While we recognize that these data were not intended for that purpose, additional information related to the performance of local agricultural systems would strengthen similar analysis of future LRP projects. The performance data provided for the three countries were also limited, particularly, that only a small number of indicators included non-zero baselines, preventing us from assessing the programs' true added value. Furthermore, issues with standardization in the available data across countries limited our capacity to make across-country comparisons of LRP project effects.

To address these limitations, we made some recommendations that can improve the capacity for future LRP project research. The first is improved standardization of reports and timely inspection by USDA personnel to ensure data completeness. Additionally, we recommend requiring that more questions include non-zero baselines so that the end line values can be compared to a starting point to estimate the programs' added value. With the implementation of these changes, LRP project data could be used to evaluate the impacts of LRP on local agricultural system capacity, capabilities, and performance more rigorously.

Research Component 3: Nutrituional Content of MGD Meals and Effects on Educational Outcomes

Senegal & Tanzania

Introduction

Research component #3 focuses on the nutritional content of MGD meals and their effect on educational outcomes. To address research component #3, MSU divided the work into three broad sub-sections.

Sub-section 1 consisted of compiling and evaluating existing data and resources. For this, the research team conducted three in-depth desk reviews of literature on current school meal programs and their benefit to educational achievements of children from sub-Saharan African countries. The desk review component evaluated existing evidence in the literature on the following three questions:

- Which nutrients are important for cognitive development?[1]
- What is the relative impact of school meal interventions in preschools on educational outcomes? [2]
- Which nutrients are associated with stunting among children ages 2 and older in sub-Saharan Africa? [3]

A systematic review was conducted for each research question using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The three articles were submitted for review to USDA-FAS team members, and all three have been submitted to peer-reviewed journals.

1 Roberts, M.; Tolar-Peterson, T.; Reynolds, A.; Wall, C.; Reeder, N.; Rico Mendez, G. The Effects of Nutritional Interventions on the Cognitive Development of Preschool-Age Children: A Systematic Review. Nutrients 2022, 14, 532. https://doi.org/10.3390/nu14030532

2 Wall, C., Tolar-Peterson, T., Reeder, N., Roberts, M., Reynolds, A., Rico Mendez, G. The Impact of School Meal Programs on Educational Outcomes in African Schoolchildren: A Systematic Review. International Journal of Environmental Research and Public Health 2022, 19 (6), 3666. https://doi.org/10.3390/ijerph19063666

3 Manuscript is under review in a peer-reviewed journal (Maternal and Child Nutrition).

Sub-section 2 of research component #3 evaluated the provided preschool meals for nutritional value, frequency of meals, adequacy of nutrient content, and dietary diversity. School food programs that are nutritionally adequate have been shown globally to improve the nutrition, education, and overall benefits of childhood growth and development (Agbozo et al., 2018). Adequate eating habits and the availability of adequate nutrition is essential for the optimal growth, development, health, disease prevention, and general well-being of children (Clark, 2012). Providing school meals to children is a well-known strategy to reduce health inequalities in children. It is also a way to enhance the overall dietary adequacy and diversity of a child by providing quality ingredients they may not receive at home (Abizari et al., 2021).

Guidelines have been set forth both nationally and internationally to regulate and develop school food programs that improve the school meal environment (Nogueira et al., 2021). THe World Health Organization (WHO), the European Commission, and Food and Agriculture Organization of the United Nations (FAO) have all established policies and guidelines to improve the environment and well-being of children around the globe (WHO, 2006). Meals should be provided in the morning to ensure that the children start their day with a full stomach, aiding in their ability to focus and learn more quickly and efficiently. Half day meals should contain 30-45% of daily energy requirements (555-830kcal). A typical school meal provided for a half-day school for example, may offer 150 grams (g) of cereal, 30g of pulses, 5g of oil, and 4g of salt (about 695 kcal) (Bundy, et al. 2009). School lunches should contribute 30-35% of the daily energy requirements (DER) for a child. Based on American guidelines, the DER of 6-10-year-old children should be 1,640 calories per day. With this information, school meals should contribute 492-574 calories per meal. For macronutrients (protein, fat, and carbohydrates) a school meal should contain 30% of the child's daily needs. However, WHO suggests that the composition of each school meal should be 10-15% protein (12-18g), 55-75% carbohydrates (68-92g), 15-30% fat (8-16g) and less than 10% saturated fat (<5.5 g) (WHO, 2006). These equate to a meal which would contain 392-584 calories.

The Institute of Medicine (IOM) recommends that school lunches should contain fresh fruits and vegetables, whole grains, and low-fat dairy products (Turner et al. 2012). Having adequate variety in the diet helps ensure adequate intake of a broad spectrum of macro- and micronutrients, and increased dietary diversity is particularly important for populations where the diet is primarily focused on a few staple starch foods. Dietary diversity can be measured at either the household or the individual level, and different indicators exist for different measurement levels and different populations. Results from this analysis for the Senegal and Tanzania cases are included in this report.

Sub-section 3 of research component #3 is an evaluation of the impact of school meal programs in Senegal and Tanzania as it relates to providing adequate nutrition for cognitive development, normal growth and development, and improving educational outcomes. To accomplish this, findings from component #3 sub-section 1 and component #3 sub-section 2 were compared and suggestions for improvement provided.

Sub-section 1: Compile and evaluate existing data and resources

Article #1
Which nutrients are important for cognitive development?

Abstract

The developing human brain requires all essential nutrients to form and to maintain its structure. Infant and child cognitive development is dependent on adequate nutrition. Children who do not receive sufficient nutrition are at high risk of exhibiting impaired cognitive skills. This systematic review aimed to examine the effects of nutritional interventions on cognitive outcomes of preschool-age children. PubMed, PsycInfo, Academic Search Complete, and Cochrane Library electronic databases were searched to identify Randomized Controlled Trials (RCTs) published after the year 2000. Studies assessing the effects of food-based, single, and multiple micronutrient interventions on the cognition of nourished and undernourished children aged 2–6 years were deemed eligible. A total of 12 trials were identified. Eight out of the twelve studies found significant positive effects on cognitive outcomes. Iron and multiple-micronutrients supplementation yield improvements in the cognitive abilities of undernourished preschool-age children. Increased fish consumption was found to have a beneficial effect in the cognitive outcomes of nourished children. On the other hand, B-vitamin, iodized salt, and guava powder interventions failed to display significant results. Findings of this review highlight the importance of adequate nutrition during preschool years, and the crucial role sufficient nutrition plays in cognitive development.

Citation & Link

Roberts M, Tolar-Peterson T, Reynolds A, Wall C, Reeder N, & Rico Mendez G. (2022). The Effects of Nutritional Interventions on the Cognitive Development of Preschool-Age Children: A Systematic Review. Nutrients, 14(3), 532. https://doi.org/10.3390/nu14030532. PMID: 35276891.

Compile and evaluate existing data and resources

Article #2
What is the relative impact of school meal interventions in pre-schools on educational outcomes

Abstract

Malnutrition and hunger can lower a child's ability to learn effectively. Many countries in Africa experience high rates of childhood undernutrition, and school feeding programs are a common tool used to address this challenge. A systematic review was conducted to evaluate the effect of school-provided meals on educational outcomes in preschool and primary school children. Specific outcomes of interest in this review included test scores, attendance, and enrollment rates. PubMed and Scopus were used for an electronic search of relevant studies. Studies included in this review were randomized and non-randomized controlled trials, prospective cohort studies, controlled before-after studies, and pre/post-test design studies published in the past 10 years in English in sub-Sahara Africa. Findings from the nine studies included in this review suggest a positive correlation between school feeding programs and educational outcomes. Although mealtime may reduce classroom time, the benefits of providing a meal outweigh the potential loss of learning time because hungry children may not learn as effectively. In conclusion, it is recommended that school meal programs be implemented and expanded. To improve general wellbeing and learning capabilities of children, school meals should be employed starting at a young age. More research on school feeding programs is needed concerning the preschool age group (2–5 years), as there is a limited amount of information in this area.

Citation & Link

Wall, C., Tolar-Peterson, T., Reeder, N., Roberts, M., Reynolds, A. & Rico Mendez, G. (2022). The Impact of School Meal Programs on Educational Outcomes in African Schoolchildren: A Systematic Review. International Journal of Environmental Research and Public Health, 19, 3666. https://doi.org/10.3390/ijerph19063666. PMID: 35329356.

Compile and evaluate existing data and resources

Article #3
Which nutrients are important to prevent stunting?

Abstract

Background: As a result of long-term undernutrition, children with stunting, or linear growth failure, face significant consequences to their neurocognitive development and future wellbeing. **Objective**: The purpose of this study was to identify specific nutrients or nutritional biomarkers of dietary intake that are associated with stunting among children ages 2 and older in sub-Saharan Africa. **Methods**: This is a systematic review conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. **Results**: 12 studies from sub-Saharan Africa met the eligibility criteria. Eleven observational studies and one randomized control trial were included. Nine of the 12 studies assessed dietary intake of macronutrients. Four studies found a significant association between proteins and stunting. Four studies found that children with stunting had lower dietary fat intakes or lower blood or serum levels of certain fatty acids. Five studies assessed dietary intake of micronutrients or looked at serum levels of a micronutrient. Among those four studies, children with stunting had lower intakes of, or biomarkers for, calcium, phosphorous, vitamin D, vitamin B12, and choline. **Conclusion:** Children with stunting tend to consume a diet lower in nutrients commonly found in high-quality protein foods such as essential amino acids, essential fatty acids, and micronutrients such as calcium, phosphorous, vitamin D, vitamin B12, and choline. Results from this review may help guide recommendations for the inclusion of specific foods and nutrients in school feeding programs to reduce immediate hunger and promote healthy growth and development that supports learning for nutritionally vulnerable children.

Citation

Reynolds, A., Tolar-Peterson, T., Roberts, M., Wall, C., Reeder, N., Pylate, L., Mathews, R., & Rico Mendez, G. (under review). Nutrients Associated with Stunting Among Children in Sub-Saharan Africa: A Systematic Review

****At the time of this report's publication this article was under review.****

Evaluate the provided pre-school meals for nutritional value, dietary diversity, frequency of meals, and adequancy of nutrient content to promote brain development and prevent stunting

Evaluation of Meals: Senegal Case

Country Profile

The Republic of Senegal is a lower-middle income country in West Africa with a population of 15.9 million (USAID, 2021a; UNICEF, 2021). While the country is politically stable, it is still one of the least developed countries in the world at 168 of 185 countries in the human development index (United Nations Development Programme, 2020). The economy depends greatly on agriculture, so it is vulnerable to climate change and natural disasters such as drought (USAID, 2021b). The country is evenly split between rural and urban areas (51% and 49% respectively), but resources are more easily accessible to people living in urban areas (USAID 2021a, 2021b). The main diet in Senegal is based on cereals like rice, millet, and sorghum mixed with vegetables and fish. Meals are typically prepared in one dish and served in portions (FAO 2010). Several factors contribute to food insecurity across the country, including a high fertility rate, young mothers, lack of dietary diversity, and inadequate food safety practices (USAID 2021).

Malnutrition due to food insecurity can impair the development and growth of a child and can lead to learning difficulties (Grantham-McGregor,2007). As of 2019, 71% of children between the ages of 6 and 56 months were affected by anemia, and 18% of children under 5 years had stunted growth (ANSD/Sénégal & ICF, 2018; ANSD & ICF, 2020).

The development of school food programs that are nutritionally adequate is essential for the success of a child. Guidelines have been set forth both nationally and internationally to regulate and develop school feeding programs that improve the school meal environment (Briggs et. al. 2010). The WHO, European Commission, and the FAO have all established policies and guidelines to improve the environment and well-being of children around the globe (WHO, 2006).

MGD aims to improve educational outcomes in low-income countries around the world by providing school meals and financial and technical support (USDA, 2021). Currently, 270 schools are benefiting from the "Sukaabe

Janngo" ("Children of Tomorrow") project implemented in the Saint Louis region of Senegal. Sukaabe Jango is the second phase of the USDA MGD project funded by the USDA-FAS (USDA, 2021). Counterpart International (CPI) is implementing Sukaabe Janngo in partnership with the Save the Children (Save) and the Associates in Research and Education for Development (ARED) organizations (USDA, 2021). The program is intended to reduce hunger and improve literacy of school-age children (USDA, 2021). Through the Sukaabe Janngo initiative, as many as 49,581 primary (6-12y) and preschool (3-5y) students have been receiving daily meals to support adequate nutrition. A small portion of benefiting children (approximately 5%) are older than 12 years old. Preschool-age children receive one meal per day five times per week. Primary-age children receive one meal on Mondays, Wednesdays, and Fridays, and two meals (breakfast and lunch) on Tuesdays and Thursdays. The meals provided to both primary and preschool children vary daily, as meals include staple foods and complementary foods provided by parents and community donations. The staple foods served to preschool children daily are fortified rice, or enriched flour, or bulgur with lentils or split green peas. Staple foods served to primary school children include fortified rice, or enriched flour, or millet, with cowpeas, or split green peas, or lentils. The same foods are served for breakfast and lunch, as staple foods provided to beneficiary children remain the same year-round. In contrast, community and parent meal contributions vary by region, season, and availability. Common daily donations include oil, onions, tomatoes, peppers, animal protein, mung bean, orange flesh sweet potatoes, and/or sugar.

Each benefitting school adjusts their menu to provide children with the most nutritious meal based on which foods are available that day. Menu adjustments are made following a specific set guideline and a recipe booklet designed to maximize the nutritional value of meals, therefore contributing to increased variety and adequacy in the children's diet. The "Guide to Setting Up and Managing School Canteens" was developed with the assistance of the School Feeding Office (DCAS) and in a collaborative work between the School Canteens Division, USAID, USDA, CPI, WFP, UNICEF, Plan International, Aide Action, and Helen Keller International. According to the guide, a balanced menu includes an energy staple food such as millet, rice, or corn, an additional food rich in energy such as vegetable oil, fat, or sugar, a food rich in protein such as milk, egg, fish, meat, peanut, cowpea, bean, lentil, and pea, and a food rich in micronutrients such as fruits and vegetable (USAID et al., 2011).

The purpose of subsection 2 of research component #3 was to analyze the nutritional value of the meals served in USDA MGD schools. It is important to know exactly what is provided to the students in order to understand the impact of these nutritional provisions on children's health and educational outcomes. This report does not contain contributions from LRP, as there are uncertainties and inconsistencies in what can be provided based on local market supply.

Provided Meals

Methodology

The nutrient analysis of this report is based on information extracted from a dataset provided by an in-country CPI representative. The dataset contains four recipes for preschool children and eight recipes for elementary school children. The recipes contained a combination of rice, flour, oil, bulgur, split peas, or lentils. The data are separated based on school level due to the difference in frequency of feeding. Children in the preschool receive a daily meal at breakfast five days per week. The elementary school provides meals at breakfast five days a week, but they also serve a meal at lunch on Tuesday and Thursday. The nutritional content analysis was conducted using the ingredient information provided in the dataset. Nutritics, a software that uses data from the USDA Nutrient Database and the Branded Food Products Database, was used to calculate nutrition values. As a protocol for this review, if an option for USDA commodity information was available it was used to create the analysis. Where USDA food aid commodity products were provided, but not available in Nutritics, nutrition values were calculated manually using the USAID Food Aid Product Information Guide. This analysis is based on the dry weight of the foods.

Meals

In the Senegal school districts of Pondor and Dagana in the Saint Louis region, school is held five days a week for an average of 180 days a year. The children in the intervention schools are provided breakfast Monday - Friday on school days for both the primary school children aged 7-12 years and the pre-primary school children aged 3-6 years. Breakfast is the only meal provided to the primary school children on Monday, Wednesday, and Friday, and

the only meal provided to the pre-primary aged children because there is only half a day of school. In addition to breakfast, primary school children are provided lunch two days of the week (Tuesday and Thursday). Lunch is provided on Tuesday and Thursday in these intervention schools, giving these children a second meal on the two days of the week they are in school for a full day.

The foods provided by the MGD program include sources of carbohydrates, protein, and fat. There are two sets of menus, one for primary school students and one for preschool students. For primary school students, the main sources of carbohydrates are rice and flour, with lentils and split peas as the main protein sources, and fortified oil as the fat source (Table 3.4). The preschool meals contain rice or flour, lentils or split peas, bulgur, and oil (Table 3.1). The primary sources of carbohydrates from the foods provided are the dry split peas, dry lentils, bulgur, wheat flour, and rice. Dry peas are a source of complex carbohydrates, a source of plant-based protein, and provide iron, zinc, potassium, and folate. The dried peas may be provided along with a fortified flour, meal, or grain, and a fortified vegetable oil. Rice is a source of complex carbohydrates and B vitamins. Dry lentils are a source of complex carbohydrates, plant-based protein, iron, zinc, potassium, and folate. Lentils may be provided with fortified flour and fortified vegetable oil. All-purpose fortified wheat flour is a source of carbohydrates that is typically included with pulses and fortified vegetable oil. Bulgur is a wheat cereal grain that is parboiled and dried. Bulgur can be used with pulses and fortified vegetable oil in school feedings. The source of fat provided comes from fortified vegetable oil. This is a source of plant-based fat that has been fortified with vitamin A and vitamin D. The fortified oil increases the caloric density of the meals and aids in the absorption of fat-soluble vitamins. This oil may be provided with fortified blended foods, flour, meal or grains, or pulses in supplemental feeding programs.

Table 3.1 Provided Foods and Their Macronutrient Content, per 100g of Each Ingredient*

Ingredient	Calories (kcal)	Protein (g)	Fat (g)	Carbohydrate (g)
Flour	364	10.33	0.98	76.3
Rice	360	6.6	.58	80
Split Peas	347	22.5	2.04	65.31
Lentils	352	24.6	1.06	63.4
Oil	884	0	0	0
Bulgur	342	12.3	1.33	75.9

*Values are based on the nutritional values presented in the USAID Food Product Information Guide

Four 115-gram meal options were provided during breakfast for children aged three to six years old. Each meal contained 20 grams of bulgur, 10 grams of oil, 25 grams of lentils or split peas, and 60 grams of rice or flour. The specific composition of each meal is specified in Table 3.3. The average macronutrient percentages of the four meals is 65.3 percent carbohydrate, 11.6 percent protein, and 23.1 percent fat.

Table 3.2 Provided foods and their key macronutrients, per 100 g of each ingredient*

Nutrient	Flour	Rice	Split peas	Lentils	Oil	Bulgur
Vitamin A (mg)	--	--	--	--	2025	--
Vitamin D (mg)	--	--	--	--	48.75	--
Iron (mg)	5.17	0.77	1.58	6.51	--	2.46
Potassium (mg)	--	--	816	577	--	--
Magnesium (mg)	--	--	--	--	--	164
Zinc (mg)	3.1	1.09	3.55	3.27	--	4.33
Thiamin (mg)	0.52	0.15	--	0.87	--	0.63
Niacin (mg)	--	3.55	--	--	--	9.11
Riboflavin (mg)	0.44	--	--	--	--	0.52
Folate (mg)	180	--	274	479	--	181
Vitamin B6 (mg)	0.44	0.6	--	0.54	--	0.74
Vitamin B12 (mg)	11	--	--	--	--	11

*Values are based on the nutritional values presented in the USAID Food Product Information Guide. Micronutrients listed are only those that are present at above 20% of the Daily Value, based on a 2,000 kcal intake.

For primary schools, there are eight different meal options for children aged 7-12 years, with all meals being 135 to 155 grams (Table 3.4). The children in the elementary schools receive breakfast every day, and they also receive lunch two to three days a week, so these meal compositions could be for either time. The primary school meals differed from the preschool meals in that they did not contain bulgur, and instead contained different combinations of rice, flour, lentils, split peas, and oil. These meals average 70% carbohydrates, 11.2% protein, and 18.9% fat.

Table 3.3 Composition of meals, Pre-schools

Meal	Foods			
Meal 1	60 g rice	25 g lentils	20 g bulgur	10 g oil
Meal 2	60 g rice	25 g split peas	20 g bulgur	10 g oil
Meal 3	60 g flour	25 g lentils	20 g bulgur	10 g oil
Meal 4	60 g flour	25 g split peas	20 g bulgur	10 g oil

Table 3.4 Composition of meals, Primary Schools

Meal	Foods		
Meal 1	100 g rice	40 g lentils	10 g oil
Meal 2	100 g flour	40 g lentils	10 g oil
Meal 3	100 g flour	45 g split peas	10 g oil
Meal 4	100 g rice	45 g split peas	10 g oil
Meal 5	100 g rice	25 g split peas	10 g oil
Meal 6	100 g flour	25 g split peas	10 g oil
Meal 7	100 g rice	25 g lentils	10 g oil
Meal 8	100 g flour	25 g lentils	10 g oil

Nutritional Adequacy of School Meals

We next compared the macronutrient and micronutrient content of each school meal to WHO recommendations for energy and macronutrient content of school meals and to the Institute of Medicine's Dietary Reference Intakes (DRIs) for micronutrient intake. For preschool meals, the 4-8 age range was used for standards of intake, and for primary school meals, the 9-12 age range was used for standards of intake. WHO recommends that school meals provide 68-92 g carbohydrate, 12-18 g protein, and 8-16 g fat. The carbohydrate, protein, and fat recommendations would equate to a meal that is 392 to 584 kcal. Table 3.5 depicts how the nutritional value of the macronutrients provided in preschool meals in Senegal compares to these WHO recommendations, by comparing the macronutrients required to the mean of the WHO provided macronutrient ranges.

"Compared to the WHO recommendations for energy and macronutrient content of school meals, the preschool meals provided in Senegal contain slightly less energy, protein, and fat than recommended, and slightly higher carbohydrates than the minimum recommendation"

Preschool meals

Compared to the WHO recommendations for energy and macronutrient content of school meals, the preschool meals provided in Senegal contain slightly less energy, protein, and fat than recommended, and slightly higher carbohydrates than the minimum recommendation (Table 5). Each of the four meals is under the recommendation for energy (kcals) by 6%, protein by 34%, and fat by 17%. Looking at micronutrients, the meals contain at least 20% of the RDA for children ages 4-8 for vitamin A, vitamin D, vitamin K, thiamin, niacin, folate, pantothenic acid, vitamin B6, vitamin B12, iron, magnesium, manganese, phosphorous, zinc, selenium, and copper (Table 3.6, Table 3.7). The meals contain less than 20% of the RDA for vitamin C, calcium, and sodium. Of note is that the meals all provide over 100% of the RDA for vitamin B12 due to the fortification of flour and bulgur with B12. The vitamin A and D content of the meals can be attributed to the fortified vegetable oil. The meals are generally a poor source of calcium, which is essential for bone health, providing 1.6-3.6% of the RDA. Iron was sufficient for each meal, with meals providing 42-48% of the RDA. Overall, the preschool meals could potentially be improved by shifting their macronutrient distribution to contain slightly less carbohydrate and slightly more protein and fat to be closer in line to recommendations that WHO has published. The meals could also potentially be improved by increasing their vitamin C and calcium content. The meals generally contain an adequate amount of key nutrients for child growth and development such as iron, zinc, vitamin A, vitamin D, and B vitamins, assuming that these meals are a supplement to other sources of nutrition children may consume to help them reach RDAs. However, these meals fall short of the MGD requirement to provide at least 30% of the RDA of key micronutrients, and no analysis has been conducted to determine how children who receive school meals are eating outside of school.

Table 3.5 Composition of Pre-school meals provided, compared to WHO recommendations for carbohydrates, protein, and fat in School Meals

Target	Meal [e]			
	Meal 1	Meal 2	Meal 3	Meal 4
Energy, kcal [a]	460 (94%)	459 (94%)	463 (94%)	461 (94%)
Carbohydrates, g [b]	86 (107%)	87 (108%)	84 (105%)	85 (106%)
Protein, g [c]	10 (66%)	10 (66%)	10 (66%)	10 (83%)
Fat, g [d]	10 (83%)	10 (83%)	10 (83%)	10 (83%)
Saturated fat, g	1.49	1.49	1.49	1.49
Monosaturated fat, g	2.21	2.21	2.21	2.21
Polyunsaturated fat, g	5.76	5.76	5.76	5.76
Omega-3 (ALA), g	0.7	0.7	0.7	0.7
Omega-6 (LA), g	5.1	5.1	5.1	5.1

[a] Reference of 488 kcal is used for energy intake. This was calculated based on the mean g of carbohydrate, protein, and fat recommended per meal.

[b] Reference of 80 g of carbohydrate is used. This was calculated based on the mean of range of 68-92 g.

[c] Reference of 15 g of protein is used. This was calculated based on the mean of range of 12-18 g.

[d] Reference of 12 g of fat is used. This was calculated based on the mean of range of 8-16 g. WHO does not have specific recommendations for types of fat provided in school meals, other than <10% of calories from saturated fat intake, but the breakdown of fat content is still provided here for informational purposes.

[e] Values are crude nutrition value provided by the meal, followed by percentage of recommended nutrition value provided.

Table 3.6 Composition of Pre-school Meals Compared to DRIs for Children Aged 4-8y (vitamins)[a]

	Meal 1	Meal 2	Meal 3	Meal 4
Vitamin A (mg)	203 (50.8%)	203 (50.8%)	203 (50.8%)	203 (50.8%)
Vitamin D (mg)	4.9 (32.7%)	4.9 (32.7%)	4.9 (32.7%)	4.9 (32.7%)
Vitamin C (mg)	1.1 (4.4%)	0.45 (1.8%)	1.1 (4.4%)	.45 (1.8%)
Vitamin E (mg)	1.1 (15.7%)	1.1 (15.7%)	1.4 (20%)	.92 (13.1%)
Vitamin K (mg)	21.5 (39.0%)	23.4 (42.5%)	22.6 (41.1%)	23.8 (43.2%)
Thiamin (mg)	0.61 (101%)	0.57 (95%)	0.56 (93.3%)	0.54 (90%)
Niacin (mg)	4.2 (52.5%)	4.2 (52.5%)	4.6 (57.5%)	4.9 (61.3%)
Riboflavin (mg)	0.1 (16.6%)	0.11 (18.3%)	0.17 (28.3%)	0.34 (56.6%)
Folate (mg)	262 (131%)	211 (105%)	150 (75%)	182 (91%)
Pantothenic Acid (mg)	1.3 (43.3%)	1.2 (40%)	1.1 (36.6%)	.64 (21.3%)
Vitamin B6 (mg)	0.3 (50%)	0.21 (35%)	0.44 (73.3%)	0.38 (63.3%)
Vitamin B12 (mg)	2.2 (183%)	2.2 (183%)	8.8 (733%)	8.8 (733%)

[a] Values are crude nutrition value provided by the meal, followed by percentage of DRI provided.

Table 3.7 Composition of Pre-school Meals Compared to DRIs for Children Aged 4-8y (minerals)[a]

	Meal 1	Meal 2	Meal 3	Meal 4
Calcium (mg)	32.2 (3.2%)	32.8 (3.2%)	35.9 (3.6%)	16.1 (1.6%)
Iron (mg)	4.7 (47%)	4.3 (43%)	4.2 (42%)	4.8 (48.0%)
Potassium (mg)	318 (13.8%)	354 (15.3%)	466 (20.2%)	286 (12.4%)
Magnesium (mg)	59 (45.3%)	60 (46.1%)	126 (96.9%)	45 (34.6%)
Manganese (mg)	1.6 (106%)	1.6 (106%)	3.4 (226%)	0.91 (60.6%)
Phosphorus (mg)	198 (39.6%)	208 (41.6%)	342 (68.4%)	139 (27.8%)
Zinc (mg)	1.8 (36%)	1.9 (38%)	2.7 (54%)	3.1 (62%)
Sodium (mg)	7.8 (0.7%)	10.1 (1.0%)	6.1 (0.6%)	4.1 (0.4%)
Selenium (mg)	9.5 (31.6%)	10.5 (35%)	37.3 (124%)	1.5 (5%)
Copper (mg)	0.38 (86.3%)	0.4 (90.9%)	0.5 (113.6%)	0.27 (61.4%)

[a] Values are crude nutrition value provided by the meal, followed by percentage of DRI provided.

Primary school meals

Compared to the WHO recommendations for energy and macronutrient content of school meals, the primary school meals provided in Senegal contain slightly less fat than recommended, and adequate energy, carbohydrate, and protein compared to recommendations (Table 3.8). Each of the four meals is under the recommendation for fat content by 17%. Looking at micronutrients, the meals contain at least 20% of the RDA for children ages 9-13 for vitamin A, vitamin D, vitamin K, thiamin, niacin, riboflavin, folate, pantothenic acid, vitamin B6, vitamin B12, iron, zinc, selenium, and copper (Table 3.9, Table 3.10). The meals contain less than 20% of the RDA for vitamin C, vitamin E, calcium, magnesium, phosphorous, and sodium. Of note is that the meals that contain flour all provide over 100% of the RDA for vitamin B12 due to the fortification of flour with B12. While meals without flour do not have an adequate quantity of B12, the amount provided through other meals is high enough to average out to an adequate amount overall. The adequate vitamin A and D content of the meals can be attributed to the fortified vegetable oil, which is the sole source of fat in the meals and helps improve the absorption of fat-soluble vitamins. The meals are generally a poor source of calcium, which is essential for bone health, providing 0.67-3.3% of the RDA. Iron was sufficient for each meal, with meals providing 69-98% of the RDA. Overall, the primary school meals could potentially be improved by shifting their macronutrient distribution to contain slightly less carbohydrate and slightly more fat to be closer in line to recommendations that WHO has published. The meals could also potentially be improved by increasing their vitamin C and calcium content. The meals generally contain an adequate amount of key nutrients for child growth and development such as iron, zinc, vitamin A, vitamin D, and B vitamins, assuming that these meals are a supplement to other sources of nutrition children consume to help them reach RDAs. However, it must again be noted that data on what children are eating outside of school is not available, and children may not be receiving other sources of nutrition.

"Overall, the primary school meals could potentially be improved by shifting their macronutrient distribution to contain slightly less carbohydrate and slightly more fat to be closer in line to recommendations that WHO has published. The meals could also potentially be improved by increasing their vitamin C and calcium content."

Table 3.8 Nutrition Value of Primary School Meals Provided Compared to WHO Recommendations for Carbohydrates, Protein, and Fat

Target	Meal [e]							
	Meal 1	Meal 2	Meal 3	Meal 4	Meal 5	Meal 6	Meal 7	Meal 8
Energy, kcal [a]	589 (120%)	583 (121%)	608 (124%)	604 (123%)	**554** (109%)	539 (110%)	536 (109%)	540 (110%)
Carbohydrates, g [b]	115 (143%)	111 (138%)	116 (145%)	120 (150%)	105 (131%)	101 (126%)	105 (131%)	101 (126%)
Protein, g [c]	16 (106%)	20 (133%)	20 (133%)	16 (106%)	11 (73%)	15 (100%)	12 (80%)	16 (106%)
Fat, g [d]	10 (83%)	10 (83%)	10 (83%)	10 (83%)	10 (83%)	10 (83%)	10 (83%)	10 (83%)
Saturated fat, g	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49
Monosaturated fat, g	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21
Polyunsaturated fat, g	5.76	5.76	5.76	5.76	5.76	5.76	5.76	5.76
Omega-3 (ALA), g	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Omega-6 (LA), g	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1

*This table uses WHO recommendations for carbohydrate, fat, and protein in school meals. The average of the ranges for each macronutrient was taken and compared against the data provided by Senegal for the food baskets provided to the school district.

[a] Reference of 488 kcal is used for energy intake. This was calculated based on the mean g of carbohydrate, protein, and fat recommended per meal.

[b] Reference of 80 g of carbohydrate is used. This was calculated based on the mean of range of 68-92 g.

[c] Reference of 15 g of protein is used. This was calculated based on the mean of range of 12-18 g.

[d] Reference of 12 g of fat is used. This was calculated based on the mean of range of 8-16 g. WHO does not have specific recommendations for types of fat provided in school meals, other than <10% of calories from saturated fat intake, but the breakdown of fat content is still provided here for informational purposes.

[e] Values are crude nutrition value provided by the meal, followed by percentage of recommended nutrition value provided.

Table 3.9 Nutrition Value of Primary School Meals Compared to DRIs for Children Ages 9-13 (vitamins)

Target	Meal [a]							
	Meal 1	Meal 2	Meal 3	Meal 4	Meal 5	Meal 6	Meal 7	Meal 8
Vitamin A (mg)	203 (33.8%)	203 (33.8%)	203 (33.8%)	203 (33.8%)	203 (33.8%)	203 (33.8%)	203 (33.8%)	203 (33.8%)
Vitamin D (mg)	4.9 (32.6%)	4.9 (32.6%)	4.9 (32.6%)	4.9 (32.6%)	4.9 (32.6%)	4.9 (32.6%)	4.9 (32.6%)	4.9 (32.6%)
Vitamin C (mg)	0.6 (1.3%)	1.8 (4.0%)	.78 (1.7%)	.81 (1.1%)	.45 (1.0%)	.45 (1.0%)	1.1 (2.4%)	1.1 (2.4%)
Vitamin E (mg)	1.0 (9.1%)	1.1 (10%)	.89 (10%)	1.0 (9.1%)	1.0 (9.1%)	0.91 (8.2%)	1.1 (10%)	1.0 (9.1%)
Vitamin K (mg)	20.7 (34.5%)	21.9 (36.5%)	25.5 (36.5%)	26.5 (44.1%)	23.6 (39.3%)	23.5 (39.1%)	21.2 (35.3%)	21.1 (35.1%)
Thiamin (mg)	.64 (71.1%)	.87 (96.6%)	.82 (91.1%)	0.9 (100%)	0.75 (83.3%)	0.7 (77.7%)	0.79 (87.7%)	0.74 (82.2%)
Niacin (mg)	4.6 (38.3%)	6.3 (52.5%)	6.4 (53.3%)	5.5 (45.8%)	4.9 (40.8%)	6.0 (50%)	4.8 (40%)	5.9 (49.2%)
Riboflavin (mg)	0.08 (8.9%)	0.53 (58.9%)	0.52 (57.8%)	0.14 (15.5%)	0.1 (11.1%)	0.5 (55.6%)	0.1 (11.1%)	.49 (54.4%)
Folate (mg)	302 (101%)	371 (123%)	294 (98%)	352 (117%)	298 (99.3%)	249 (83%)	349 (116%)	300 (100%)
Pantothenic Acid (mg)	1.3 (32.5%)	.85 (21.3%)	.76 (19%)	1.8 (45%)	1.4 (35%)	.44 (11%)	1.5 (37.5%)	.53 (13.3%)
Vitamin B6 (mg)	.23 (23%)	.66 (66%)	0.5 (50%)	0.24 (24%)	0.21 (11.6%)	0.48 (48%)	0.3 (30%)	0.58 (58%)
Vitamin B12 (mg)	0 (0%)	11 (611%)	11 (611%)	0 (0%)	0 (0%)	11 (611%)	0 (0%)	11 (611%)

[a] Values are crude nutrition value provided by the meal, followed by percentage of DRI provided.

Table 3.10 Composition of Primary School meals compared to DRIs for children aged 9-13 (minerals)

Target	Meal [a]							
	Meal 1	Meal 2	Meal 3	Meal 4	Meal 5	Meal 6	Meal 7	Meal 8
Calcium (mg)	35.5 (2.7%)	13.9 (1.1%)	16.0 (1.2%)	44 (3.3%)	37 (2.8%)	9.2 (0.7%)	36.5 (2.8%)	8.7 (0.67%)
Iron (mg)	5.6 (70%)	7.8 (97.5%)	7.1 (88.8%)	6.4 (80%)	5.5 (68.8%)	6.4 (80%)	5.9 (73.8%)	6.8 (85%)
Potassium (mg)	262 (10.9%)	269 (11.2%)	356 (14.8%)	483 (20.1%)	319 (13.3%)	204 (8.5%)	282 (11.8%)	168 (7%)
Magnesium (mg)	39.2 (16.3%)	18.7 (7.8%)	21.2 (8.8%)	47 (19.6%)	37 (15.4%)	12.2 (5.1%)	36.5 (15.2%)	11.7 (4.9%)
Phosphorus (mg)	186 (14.9%)	112 (9%)	139 (11.1%)	258 (11.1%)	194 (15.5%)	80 (6.4%)	184 (14.7%)	70 (5.6%)
Zinc (mg)	1.6 (20%)	4.4 (55%)	4.6 (57.5%)	2.7 (33.8%)	0.75 (83.3%)	4 (50%)	1.9 (23.8%)	3.9 (48.8%)
Sodium (mg)	5.8 (.48%)	2.4 (.20%)	6.5 (0.5%)	11.7 (0.97%)	4.9 (40.8%)	3.7 (0.31%)	6.5 (0.54%)	1.5 (0.1%)
Selenium (mg)	16.2 (40.5%)	0.04 (1%)	1.8 (4.5%)	16.9 (42.3%)	0.1 (2.5%)	1.0 (2.5%)	15 (37.5%)	0.02 (0.05%)
Copper (mg)	.32 (30%)	.03 (42.9%)	.35 (50%)	.58 (82.9%)	0.2 (28.6%)	0.2 (28.6%)	.41 (58.6%)	0.19 (27.1%)

[a] Values are crude nutrition value provided by the meal, followed by percentage of DRI provided.

School Meal Contributions to Dietary Diversity

For Senegal, no dietary recall data was available that would allow us to determine dietary diversity at the individual level. Therefore, this analysis takes into consideration only the meals that children are provided in the school setting, and all foods consumed outside the school were not considered. This approach was taken in efforts to understand how the MGD feeding initiative contributes to the dietary diversity of benefiting children, given the data that were available to the research team and feasible for collection by in-country representatives.

"The provided school meals are comprised of grains and legumes, providing only two out of the four minimum food groups desired for dietary adequacy. Grains provide fiber and calories to meals, as well as B vitamins (FAO & FHI, 2016)."

The foods provided in each school meal were compared to a list of 13 different food groups (the G13 food group indicator). Although all food indicators have revealed good correlations with mean adequacy ratio (MAR), the G13 version was found to be slightly better than other group indicators to classify the diet of children ages 1 to 9 years of age regarding micronutrient adequacy (Steyn, et al., 2014). A dietary diversity score of 4 or greater was considered to indicate micronutrient adequacy, as it is the recommended cut off for the selected food group indicator (Steyn, et al., 2014).

Based on the dietary diversity analysis, the school meals provided to both preschool and primary school age children are lacking in variety to ensure adequate micronutrient content. The meals do not provide enough variety of food groups to meet the minimum score of four food groups. Table 3.11 and Table 3.12 display the dietary diversity scores of meals provided to preschool and primary school students. The provided school meals are comprised of grains and legumes, providing only two out of the four minimum food groups desired for dietary adequacy. Grains provide fiber and calories to meals, as well as B vitamins (FAO & FHI, 2016). B vitamins such as thiamine, riboflavin, vitamin B3, vitamin B6, and pantothenic acid are directly involved in the metabolism of protein, carbohydrates, and fats (Huskisson et al., 2007). Legumes are protein rich, which is important since school meals lack animal-source foods (FAO & FHI, 2016). According to in-country implementers, the wheat flour and rice provided to children are iron and folate fortified. The oil and the orange-flesh sweet potatoes donated by the community are fortified with vitamin A. Food fortification has been demonstrated to be a cost-effective strategy to reduce the burden of food insecurity and to provide health benefits, however the long-term effects of such strategies are not as established (Olson et al., 2021).

In comparison, school meals that are composed of staple foods in addition to parent and community donations help contribute to greater dietary diversity, providing at least four food groups. Such meals were developed following the "Guide to setting up and Managing School Canteens" and the Yaajeende recipe booklet. The Yaajeende recipe booklet provides schools with recipes that support adequate nutrition and facilitate the inclusion of regional foods and community donations into recipes. The recipe booklet was a resource developed by the Yaajeende Nutrition-Led Agriculture Program (USAID, 2017). Tables 3.13 through 3.17 demonstrate the food groups provided to preschool and primary school students with community donations.

Table 3.11 Minimum Dietary Diversity Score of Meals provided to Pre-school students

Question #	Food Group	Examples	YES=1 NO=0
1	Cereals (food made from grains), roots, tubers, and plantains	Rice, flour, and bulgur	1
2	Milk and milk products		0
3	Eggs		0
4	Flesh meats		0
5	Fish		0
6	Legumes, nuts & seeds	Lentils and split peas	1
7	Vitamin A-rich dark green leafy vegetables		0
8	Vitamin A-rich deep yellow/ orange/red vegetables		0
9	Vitamin A-rich fruits		0
10	Vitamin A-rich vegetables		0
11	Vitamin C-rich fruits		0
12	Other fruits		0
13	Other vegetables		0
Total number of food groups included			**2**

Table 3.12 Minimum Dietary Diversity Score of meals provided to Primary School students

Question #	Food Group	Examples	YES=1 NO=0
1	Cereals (food made from grains), roots, tubers, and plantains	Rice and flour	1
2	Milk and milk products		0
3	Eggs		0
4	Flesh meats		0
5	Fish		0
6	Legumes, nuts & seeds	Lentils and split peas	1
7	Vitamin A-rich dark green leafy vegetables		0
8	Vitamin A-rich deep yellow/ orange/red vegetables		0
9	Vitamin A-rich fruits		0
10	Vitamin A-rich vegetables		0
11	Vitamin C-rich fruits		0
12	Other fruits		0
13	Other vegetables		0
Total number of food groups included			**2**

Table 3.13. Minimum Dietary Diversity Score of meals including community donations

Question #	Food Group	Examples	YES=1 NO=0
1	Cereals (food made from grains), roots, tubers, and plantains	Rice, cassava, and bulgar	1
2	White roots, tubers, and plantains		0
3	Milk and milk products		0
4	Eggs		0
5	Flesh meats	Beef and fillet	1
6	Fish		0
7	Legumes, nuts & seeds	Lentils and cowpeas	1
8	Dark green leafy vegetables		0
9	Vitamin A-rich deep yellow/ orange/red vegetables		0
10	Vitamin A-rich fruits		0
11	Vitamin A-rich vegetables	Carrots, sweet potatoes, and squash	1
12	Vitamin C-rich fruits		0
13	Other fruits		0
14	Other vegetables		0
	Total number of food groups included		**4**

Table 3.14. Minimum Dietary Diversity Score of meals including community donations

Question #	Food Group	Examples	YES=1 NO=0
1	Cereals (food made from grains)	Flour and millet semolina	1
2	Milk and milk products		0
3	Eggs		0
4	Flesh meats		0
5	Fish	Guedj (dry fish)	1
6	Legumes, nuts & seeds	Peanut flour and peas	1
7	Dark green leafy vegetables		0
8	Vitamin A-rich deep yellow/ orange/red vegetables		0
9	Vitamin A-rich fruits		0
10	Vitamin A-rich vegetables		0
11	Vitamin C-rich fruits		0
12	Other fruits	Tamarind	1
13	Other vegetables	Onions, cherries, and tomatoes	1
Total number of food groups included			**5**

Table 3.15 Minimum Dietary Diversity Score of meals including community donations

Question #	Food Group	Examples	YES=1 NO=0
1	Cereals (food made from grains), roots, tubers, and plantains	Rice	1
2	Milk and milk products		0
3	Eggs	Eggs	1
4	Flesh meats	Chicken	1
5	Fish		0
6	Legumes, nuts & seeds	Lentils	1
7	Dark green leafy vegetables	Moringa leaf	1
8	Vitamin A-rich deep yellow/ orange/red vegetables		0
9	Vitamin A-rich fruits		0
10	Vitamin A-rich vegetables	Orange flesh sweet potatoes, carrots	1
11	Vitamin C-rich fruits		0
12	Other fruits		1
13	Other vegetables	Tomatoes	1
Total number of food groups included			**7**

Table 3.16 Minimum Dietary Diversity Score of meals including community donations

Question #	Food Group	Examples	YES=1 NO=0
1	Cereals (food made from grains),	Bulgur, wheat flour	1
2	Milk and milk products		0
3	Eggs	Eggs	0
4	Flesh meats	Chicken	0
5	Fish	Fish	1
6	Legumes, nuts & seeds	Peas	1
7	Dark green leafy vegetables	Moringa leaves	1
8	Vitamin A-rich deep yellow/ orange/red vegetables		0
9	Vitamin A-rich fruits		0
10	Vitamin A-rich vegetables	Orange flesh sweet potatoes, carrots, squash	1
11	Vitamin C-rich fruits		0
12	Other fruits		0
13	Other vegetables	Tomatoes, onions and garlic	1
Total number of food groups included			**6**

Table 3.17 Minimum Dietary Diversity Score of meals including community donations

Question #	Food Group	Examples	YES=1 NO=0
1	Cereals (food made from grains), roots, tubers, and plantains	Bulgar and rice	1
2	Milk and milk products		0
3	Eggs		0
4	Flesh meats		0
5	Fish	Fish	1
6	Legumes, nuts & seeds	Lentils and peas	1
7	Dark green leafy vegetables	Turnip	1
8	Vitamin A-rich deep yellow/ orange/red vegetables		0
9	Vitamin A-rich fruits		0
10	Vitamin A-rich vegetables	Orange flesh sweet potatoes, carrots	1
11	Vitamin C-rich fruits		0
12	Other fruits		0
13	Other vegetables	Onions	1
Total number of food groups included			**7**

Discussion And Conclusion

The MGD Food for Education program school meals that are provided in Senegal are portioned to provide at least 20% of the RDA of many of the key nutrients that are essential for children to prevent malnutrition and enhance health and development. The meals for preschool and primary school children do contain slightly less fat than recommended, while still containing adequate (primary schools) or slightly less (preschools) calories than recommended. Meals for preschool and primary school students contain more than an adequate amount of carbohydrates, so one thing to consider may be whether meals could be better balanced by providing more beans and oil, which would increase the protein and fat content. The meals currently provide 10 g of oil which is important to note because the oil provided has been fortified with vitamin A and vitamin D. Without these vital fortified nutrients, there could be potential for a child to become deficient in either of these vitamins, especially if these meals are the primary or only source of food for that day. Each meal is designed to provide the most optimal nutrition for those receiving the food, by pairing carbohydrate, protein, and fat sources together. However, the ingredients also need to be portioned so that the children can maximally benefit from the meals provided at school. Finally, the foods provided are low in a few specific important nutrients, notably, vitamin C and calcium. One thing to look at may be whether the foods provided by the community are a good source of vitamin C, calcium, protein, or fat, to see whether or how much of the gap could be filled by these foods.

The community donations are added to meals in accordance with the school canteen guide and recipe booklet. Most of the recipes available to schools are nutritionally adequate, providing children with a minimum of four food groups. The addition of flesh meats, vitamin A rich fruits and vegetables, and other vegetables provide essential nutrients previously lacking in school meals that were comprised of only the staple foods. The flesh foods and the fish food groups provide all essential amino acids in addition to iron, zinc, and vitamin B12 (FAO & FHI, 2016). Vitamin B12 is essential for adequate brain development, protein synthesis, and for the metabolism of fats and carbohydrates (Huskisson et al., 2007). Iron is a nutrient of particular concern among school-age children, as iron deficiency and iron-deficiency anemia are a prevalent problem worldwide impairing the cognitive development of children (Best et al., 2010). Africa displays the highest regional prevalence of iron deficiency anemia, which negatively impacts healthy development (Best et al., 2010; Halterman et al., 2001). Furthermore, animal-foods provide iron that is more bioavailable than plant-based foods, which can play a significant role in minimizing the prevalence of inadequate iron status among school age children (Best et al., 2010; FAO & FHI, 2016). Therefore, community and parent contributions have a direct positive effect on dietary diversity for students. Meals that incorporate the donations provide a minimum of four food groups, therefore increasing the nutritional value of meals and providing meals that support adequate nutrient consumption.

Limitations

A limitation of our Senegal case study is the limited data available on specific school feeding practices pertaining to exact recipes and serving sizes of meals. Although there is detailed data available on the food commodities provided by the USDA, recipes and menus that school districts are using cannot be precisely analyzed due to the lack of key information such as serving size and ingredient measurements. Finally, this report only considers foods consumed in school. Therefore, it does not consider daily diet variability, and it is not a direct reflection of the actual 24-hour intake of participants.

Conclusion

The school meals provided in Senegal for preschool and primary school students are generally nutritionally adequate but could be improved with increased protein, fat, vitamin C, and calcium content. While the meals contain at least 20% of the RDA of a number of key nutrients, the meals are falling short of meeting the MGD requirement that 30% of the RDA of all key nutrients be provided. Additionally, the community and parent contributions have a clear positive effect on the dietary diversity of students. Meals that incorporate donations generally provide a minimum of four food groups, therefore increasing the nutritional value of meals and providing meals that support adequate nutrient consumption. Going forward, it is recommended that implementors collect data on food consumption outside of school and design rations to fill found nutrient gaps.

Evaluation of Meals: Senegal Case

Country Profile

The purpose of this report was to analyze the nutritional adequacy and dietary diversity of the meals provided in supported primary schools in Tanzania. It is important to understand exactly what is provided to the students in order to understand the impact of these nutritional provisions on children's health and educational outcomes. This report highlights the need to improve the dietary diversity of school age children living in Tanzania.

The United Republic of Tanzania is a coastal, lower-middle income country in East Africa with a population of 56.3 million (UNICEF, 2019; USAID, 2021). Tanzania is the tenth largest economy in Africa and has a fast-growing economy (FAO, 2010). However, the population has been unevenly impacted by economic development (FAO, 2010). Only urban areas of Tanzania have been affected by economic advances, while the rural areas remain unaffected (FAO, 2010). The agriculture sector is the largest employer across the country with 63 percent of the population living in rural areas. As a result, many children living in rural areas experience poverty and malnutrition (FAO, 2010). There are 9.3 million children under the age of 5 years in Tanzania, and 34% are stunted (MoHCDGEC, 2016; USAID, 2021). Sixty percent of children aged 6-59 months are suffering from anemia (MoHCDGEC, 2016). Among rural children, 81% live in poverty (FAO, 2010). The prevalence of stunting among adolescents, ages ranging from 10 to 19 years, living in rural areas is estimated to be 64.2% in comparison to 3.9% in urban areas (Ismail et al., 2019).

The diet of the rural and urban populations is based on cereals, roots, and tubers (FAO, 2008). Potatoes, rice, cassava, and sorghum are also staple items among the population (FAO, 2008). Stiff porridge is often the main food prepared for meals, and it is made of maize flour, sorghum, or cassava (FAO, 2008). Common side dishes include sardines, pulses, or various meats (FAO, 2008). The rural population displays a higher frequency of vegetable consumption than the urban population, however the quantities of vegetables consumed are small and do not contribute significantly to nutritional intake (FAO, 2008). The population's diet is not diversified, as the majority of households have limited income and give priority to bulky items such as maize and cassava, and other food items such as oils are considered a luxury item by most rural communities (FAO, 2008).

In the past decade, several initiatives have been implemented in Tanzania to reduce hunger and the percentage of children who are stunted or suffering from chronic malnutrition (MoHCDGEC et al., 2018). Between 2014 and 2018, the percentage of malnourished or stunted children decreased by 2.9% (34.7% to 31.8%) (MoHCDGEC et al., 2018). The National Multi-Sectoral Nutrition Action Plan (NMNAP) aimed to reduce the percentage of stunted children from 34.5% to 28% by 2021 (UNICEF, 2016). According to a recent report, the mid-point target of 32% has been met (MoHCDGEC et al., 2018). Despite progress achieved to improve children's nutrition in Tanzania, according to the Second National Nutrition Survey conducted in 2018, it is estimated that as many as three million children under five years of age are stunted (MoHCDGEC et al., 2018). It was projected that approximately 420,000 children under five years would suffer from acute malnutrition in 2019, and 85,000 from severe acute malnutrition with a high risk of death if appropriate interventions were not implemented (MoHCDGEC et al., 2018).

In efforts to reduce the burden of undernutrition and improve the health and literacy outcomes of primary school-age children affected by economic disparities in the Mara Region, Project Concern International (PCI) has been partnering with the USDA-FAS under the funding of MGD to implement the Food for Education initiative since 2010 (PCI, 2021). The ongoing partnership aims to improve the health and dietary practices of students attending 231 primary schools and to assist the Government of Tanzania in improving literacy outcomes and student attendance in participant schools (PCI, 2021). The project is implemented in the Mara region of Tanzania, specifically the districts of Bunda, Butiama, and Musoma Rural (PCI, 2021). Since the project's implementation began, over 190,000 primary school students have been receiving

daily school meals approximately five times a week from USDA-donated commodities. A total of 242,423 students have benefited from meals since inception of the project (PCI, 2021). School meals benefiting children receive USDA-donated commodities including rice, beans, and cooking oil. This is a particularly significant contribution as many primary schools in Tanzania do not provide daily school meals. Approximately 9.5 million students in the 20,000 schools of Tanzania are not supported by school meal initiatives (PCI, 2021).

In 2019, the Government of Tanzania stopped importations of USDA-commodities and changes were made to the FFE initiative. Starting in 2020, PCI accelerated the school feeding program to promote community led initiatives and diversify meals provided to students according to school location, availability of food items, and seasonality. In addition, community contributions including maize, corn, sorghum, millet, orange flesh sweet potatoes, and green vegetables have been collected daily to complement school meals. According to an in-country staff member from PCI, daily school meals are comprised of a cooked mixture of maize, beans, and oil. Some schools can provide porridge, sweet potatoes, rice and beans, vegetables, and fruits to students through the local assistance of community contributions and school gardens. Changes to the school meal menu were reported to occur often in efforts to adjust to food availability and seasonality. MGD and LRP supported schools provide an average of 1 to 5 meals per week, depending on availability of contributed commodities, and students only receive meals when schools are open.

Provided Meals

Introduction

School meals in Tanzania typically consist of grains, maize, legumes, and fortified oil previously provided by the MGD program. If fresh fruits, whole grains, or low-fat dairy is provided by parents or local vendors there is no evidence provided.[1] The government of Tanzania has taken various actions to create a healthy and sustainable environment for children to learn in by providing children with meals from local vendors; however, previously, USDA commodities were provided, which is the focus of this report. Data on school meals in Tanzania is scarce and nutritional adequacy has not been amply assessed. This report aims to analyze the nutritional value and nutritional adequacy of the menus provided by MGD to the Tanzania school districts.

Materials and Methods

Study Design Population and Sampling

This is a secondary data analysis of data provided by the MGD program of a school meals program Tanzania. As of 2016, this project has provided meals for 318,000 children from 33 million dollars from the USDA. Prior numbers on meals provided and students fed were not available prior to 2016. These meals are provided by PCI with funds from USDA, and in collaboration with the Government of Tanzania, and local organizations, like parent-teacher associations. Table 3.18 shows menu information prepared by PCI in Tanzania. This is the updated menu after the commodity changes in 2019.

Nutritional Adequacy of School Meals

To analyze the meal data provided by Tanzania, Nutritics, a nutrition analysis software was used to calculate the nutritional value of the menus for calories, macronutrient, and micronutrient content.

Results

In the Tanzanian school system, school is held five days a week for an average of 180 days a year. The children in the intervention schools are provided breakfast Monday - Friday on school days. The food provided by the MGD program can be found in Table 3.19 and includes sources for carbohydrate, a protein, and a fat. The foods included are maize, dried beans, and oil. These food products are grown and manufactured in the United States from 100% U.S. sourced ingredients. As of 2019, this practice has ended due to political changes in the country. Tanzania now receives funds from the LRP program in order to seek alternatives to increase food supply from local growers and producers (USDA, 2019; USDA, 2016).

1 Parent or community contributions include labor, cash, materials for school rehabilitation, and in cases, foods like beans, vegetables, maize, millet, and salt.

Table 3.18 Contents of MGD Tanzania Primary School Ration

Ingredient	Ration grams (g) per person (pp) per day (pd)	kcal pp pd	Fat g pp pd	Protein g pp pd
Maize	120	438.0	5.6	11.3
Beans	30	103.3	0.426	6.5
Fortified Oil	5	44.2	5.0	0.0
Totals	**155g**	**584**	**11**	**17.8**
% Required Daily Allowance (Based on 1,842 kcal for average 5 - 13-year-old, per FAO)		**32%**	**37%**	**66%**

Table 3.19 Macronutrient Content of Tanzania Rations

Ingredient	Calories	Protein (g)	Fat (g)	Carbohydrate (g)
Maize	360	6.6	0.58	80
Beans	347	22.5	2.04	65.31
Oil	884	0	0	0

*This table contains the USAID macronutrients contents of the USAID food basket per 100g of ingredient.

Table 3.20 Meal Provided by Tanzania's School District (New Ration)

Ingredient	Ration	Calories	Fat (g)	Protein (g)	Carbohydrate (g)
Maize	120g	438	5.6	11.3	80
Beans	30g	102	0.426	6.5	65.31
Oil	5g	44	5	0	0
Totals	**155g**	**484**	**11**	**17.8**	**145.3**

Description of Food Provided in Meals

The main source of carbohydrates are dry split peas, dry lentils, bulgur, wheat flour, and rice. Dry beans are a source of complex carbohydrates, a source of plant-based protein, iron, zinc, potassium, and folate. These dried beans may be provided with a fortified flour, meal, or grain, and a fortified vegetable oil in a supplemental food basket. Maize is a cereal grain that is dried and fortified. Bulgur can be used with pulses and fortified vegetable oil in school feedings. The source of fat provided comes from fortified vegetable oil. This is a source of plant-based fat that has been fortified with vitamin A and vitamin D. The intent of the fortified oil is to increase the caloric density of the meal and aid in the absorption of fat-soluble vitamins. This oil may be provided with fortified blended foods, flour, meal or grains, or pulses in supplemental feeding programs.

Table 3.21 Nutrition Value of Ration Compared to WHO Recommendations for Carbohydrates, Protein, and Fat

Macronutrient	Nutrition Value Provided [e]
Energy, kcal [a]	593 (121.5%)
Carbohydrates, g [b]	106 (132.5%)
Protein, g [c]	16.1 (107.3%)
Fat, g [d]	5 (42%)
Saturated fat, g	0.745
Monosaturated fat, g	1.1
Polyunsaturated fat, g	2.88
Omega-3 (ALA), g	0.35
Omega-6 (LA), g	2.55

[a] Reference of 488 kcal is used for energy intake. This was calculated based on the mean g of carbohydrate, protein, and fat recommended per meal.

[b] Reference of 80 g of carbohydrate is used. This was calculated based on the mean of range of 68-92 g.

[c] Reference of 15 g of protein is used. This was calculated based on the mean of range of 12-18 g.

[d] Reference of 12 g of fat is used. This was calculated based on the mean of range of 8-16 g. WHO does not have specific recommendations for types of fat provided in school meals, other than <10% of calories from saturated fat intake, but the breakdown of fat content is still provided here for informational purposes.

[e] Values are crude nutrition value provided by the meal, followed by percentage of recommended nutrition value provided.

Table 3.22 Nutrition Value of Ration Compared to DRI's for Children Aged 9-13 (Vitamins)

Micronutrient	Nutrition Value Provided [a]
Vitamin A (mg)	101.5 (25.4%)
Vitamin D (mg)	2.5 (16.6%)
Vitamin C (mg)	1.3 (2.9%)
Vitamin E (mg)	0.51 (4.6%)
Vitamin K (mg)	11.6 (19.3%)
Thiamin (mg)	0.56 (62.2%)
Niacin (mg)	4.2 (35.0%)
Riboflavin (mg)	0.27 (30.0%)
Folate (mg)	137 (45.7%)
Pantothenic acid (mg)	0.23 (5.8%)
Vitamin B6 (mg)	0.74 (74.0%)
Vitamin B12 (mg)	0 (0%)

[a] Values are crude nutrition value provided by the meal, followed by percentage of DRI provided.

Table 3.23. Nutrition Value of Ration Compared to DRIs for Children Aged 9-13 y (Minerals)

Micronutrient	Nutrition Value Provided [a]
Calcium (mg)	24.8 (1.9%)
Iron (mg)	5.1 (63.8%)
Potassium (mg)	711 (28.4%)
Magnesium (mg)	167 (69.6%)
Phosphorus (mg)	1.3 (68.4%)
Zinc (mg)	431 (34.5%)
Sodium (mg)	3.0 (37.5%)
Selenium (mg)	24.8 (1.9%)
Copper (mg)	0.38 (54.3%)

[a] Values are crude nutrition value provided by the meal, followed by percentage of DRI provided.

Compared to the WHO recommendations for energy and macronutrient content of school meals, the meal provided through the MGD program in Tanzania contains more energy, carbohydrates, and protein than the minimum recommendation, and less fat than recommended (Table 3.21). The meal is under the recommendation for fat by 58%. Looking at micronutrients, the meals contain at least 20% of the RDA for children ages 9-13 for vitamin A, vitamin D, thiamin, niacin, riboflavin, folate, vitamin B6, iron, potassium, magnesium, manganese, phosphorous, zinc, selenium, and copper (Table 3.22, Table 3.23). The meals contain less than 20% of the RDA for vitamin A, vitamin C, vitamin E, vitamin K, pantothenic acid, vitamin B12, calcium, and sodium. Of note is that these meals do not contain any vitamin B12. Vitamin B12 is found in foods of animal origin such as beef, chicken, fish, milk and cheese. Plant-based foods such as cereals and grains can be fortified with vitamin B12, though, to the best of our knowledge, the maize provided in these meals is not fortified with vitamin B12. The vitamin A and D content of the meals can be attributed to the fortified vegetable oil. However, since these meals contained only 42% of the WHO recommended fat content of a school meal, and less than 20% of the RDA for vitamin D, increasing the oil content of the meals could prove beneficial. The meals contain minimal calcium, which is essential for bone health, providing 1.9% of the RDA. Iron was sufficient for each meal, with meals providing 63.8% of the RDA. Overall, these meals could potentially be improved by shifting their macronutrient distribution to contain slightly less carbohydrate and slightly more fat to be closer in line to recommendations that WHO has published. The meals could also potentially be improved by increasing their vitamin C and calcium content. The meals do generally contain an adequate amount of key nutrients for child growth and development such as iron, zinc, vitamin A, and B vitamins, assuming that these meals are a supplement to other sources of nutrition children may consume to help them consistently reach RDAs.

Contribution of School Meals to Dietary Diversity

Introduction

In Tanzania, the in-country survey team prepared and administered a culturally adapted questionnaire that included questions about diet. The questionnaire included introductory text, instructions, and guidance for reporting to the survey team. The questionnaire implemented the list-based method in which an extensive food list was developed by the survey team and added in accordance with the dietary habits of the target audience, and available local foods. The questionnaire also included other health related questions in which participants were asked about hygiene practices and their perception of the importance of nutrition. The questionnaire included questions regarding food items consumed by students throughout the previous day (past 24-hours). As the population of interest were preschool and primary school-aged children, the questionnaire was conducted at the individual level.

There is currently no dietary diversity tool available to assess diet quality that takes into consideration the unique nutritional needs of preschool and primary school age children. There is an 8-item minimum dietary diversity (MDD) tool designed to assess the diet quality of infants and children less than 2 years of age, and a 10-item indicator specifically targeted to women of reproductive age (WRA), the MDD-W (Solomon et al., 2017; FAO, 2021). Since there is currently no validated tool to assess minimum dietary diversity among school-age children greater than two years of age, we considered a modified version of WHO's 8-item MDD tool, utilizing all food groups except for the breast milk group. While this is far from ideal, it allowed us to utilize available data to synthesize survey responses into a general understanding of the diversity of children's' diets in intervention and control schools. Thus, we categorized responses to food item questions into seven major food groups: (i) grains, roots, and tubers; (ii) legumes and nuts; (iii) flesh foods (meat, fish, poultry, and liver/organ meats); (iv) eggs; (v) vitamin A rich fruits and vegetables; (vi) dairy products (milk, yogurt, cheese); and (vii) other fruits and vegetables. If a student consumed at least one food item from a food group throughout the previous day, the food group was assigned a value of one (1) for that student, and zero (0) if not consumed in the past 24-h. The food group scores were then summed up to obtain a dietary diversity score, which ranged from zero to seven, whereby zero represents non-consumption of any of the food items in the selected food groups, and seven represents the highest possible level of dietary diversification.

Children were considered to have an adequately diverse diet if they consumed four or more food groups (FG ≥ 4) out of the seven food groups over the previous day. A score of 4 was chosen as it is the recommended cut off for the selected food group indicator (Stylen, et al., 2014). This report takes into consideration all foods consumed inside and outside the school setting. This approach was taken in efforts to better understand how MGD FFE initiative and the 'Chakula Chetu' Project Intervention is impacting the nutritional status of benefiting students and if the children are consuming an overall adequate diet that supplies all essential nutrients.

Material and Methods

The data used to evaluate the dietary diversity of primary school-age children were secondary data provided by an in-country PCI representative. A Tanzania firm, IPSOS Tanzania, was responsible for all quantitative and qualitative data collection processes. Quality control was supported by a consulting company, Trembley Consulting. A quasi-experimental, mixed-methods approach was adopted to assess school feeding interventions performance and impact indicators.

A total of 1600 students attending 100 primary schools in the Bunda, Musoma Rural, Butiama, and Serengeti districts were randomly selected to participate in the 24-hour recall questionnaire. Students were asked to report all food items consumed yesterday (past 24-h) inside and outside the school setting. Students were also asked to describe all foods (meals and snacks) eaten in addition to any beverages consumed during the day or night. A digital tablet tool available to the PCI and trained staff was used to record student responses and the results were presented in an excel spreadsheet.

Baseline Intervention Results

Student Characteristics

Table 3.24 describes the baseline location distribution of the children who participated in the 24-h recall study. A total of 1600 children aged seven to seventeen years

were included in the evaluation. Among the children, 800 (49.9%) and 800 (49.9%) were boys and girls, respectively. The mean age of the children was 12 ± 2.8 years, with 61% of children aged more than 12 years. Most children were enrolled in 2nd grade (37.5%) and 4th grade (37.7%) at the time of the study, and a smaller number of children attended 6th grade (12.5%) and 7th grade (12.5%). The majority of children were full day term students (79.6%), while 12.6% were morning only term, and 7.7% afternoon only.

The student's household primary occupation was reported as Agriculture (88.1%) and Livestock (3.3%). Table 3.25 summarizes the occupation of student parents.

Dietary Diversity

Children from the intervention group who received an average of 5 school meals per week through the FFE or 'Chakula Chetu' initiatives had greater dietary diversity than children from control schools. However, most children from both intervention and control groups are not currently getting the recommended minimum of 4 food groups per day. As many as 84% of children, from both intervention and control groups, reported consuming 3 or less food groups in the previous 24 hours. Only 16% of students from the intervention group and 15% of control students reported consuming 4 or more food groups per day. As many as 45% of children consumed 2

Table 3.24 Student Baseline Distribution Based on Location

District	Number of Subjects	Percent
Bunda	352	22%
Butiama	192	12%
Musoma Rural	256	16%
Serengeti	800	50%
Total	1600	100%

Table 3.25 Summary of Occupations Held by Parents of Surveyed Students

Occupation	Frequency	Percent
Agricultural Laborer	23	1.5
Agriculture	1411	88.1
Large Business	2	.1
Livestock	53	3.3
Pension	1	.1
Petty Business	35	2.2
Salaried	42	2.6
Skilled Worker	12	.7
Unemployed	4	.2
Unknown	2	.1
Other	15	.9

or less food groups in the previous 24 hours. Figure 3.1 and Figure 3.2 summarize the dietary diversity findings. The mean number of food groups consumed per day by survey participants, comprising both control and intervention schools, was 3.15 ± 1.4. Female students displayed a lower mean score (3.12 ± 1.41) than male students (3.18 ± 1.44). Children from Butiama district displayed the highest mean scores (3.37 ± 1.48), followed by Musoma Rural district (3.15 ± 1.63), and Serengeti (3.15 ± 1.33). Students from Bunda district exhibited the lowest mean average score (3.04 ± 1.422). The majority of intervention children reported consuming grains (98%) and legumes (44%). FFE and 'Chakula Chetu' benefiting children also reported having consumed flesh foods (62%) and other fruits and vegetables (36%) in the past 24-h. Roots were consumed by 21% of intervention

Figure 3.1 Percentage of Children Who Consume Zero, One, Two, Three, Four, Five, Six or Seven Food Groups Per Day in Intervention Schools

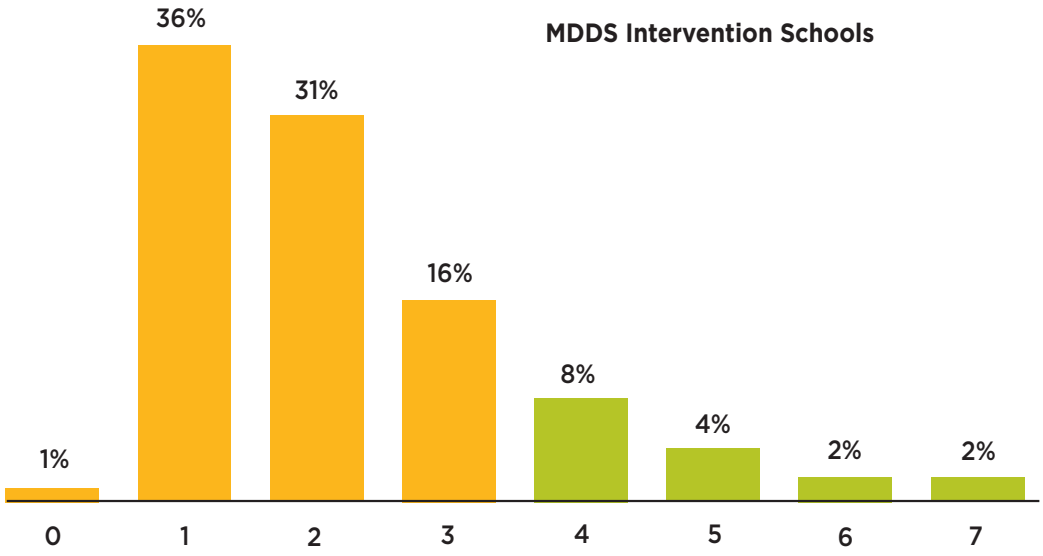
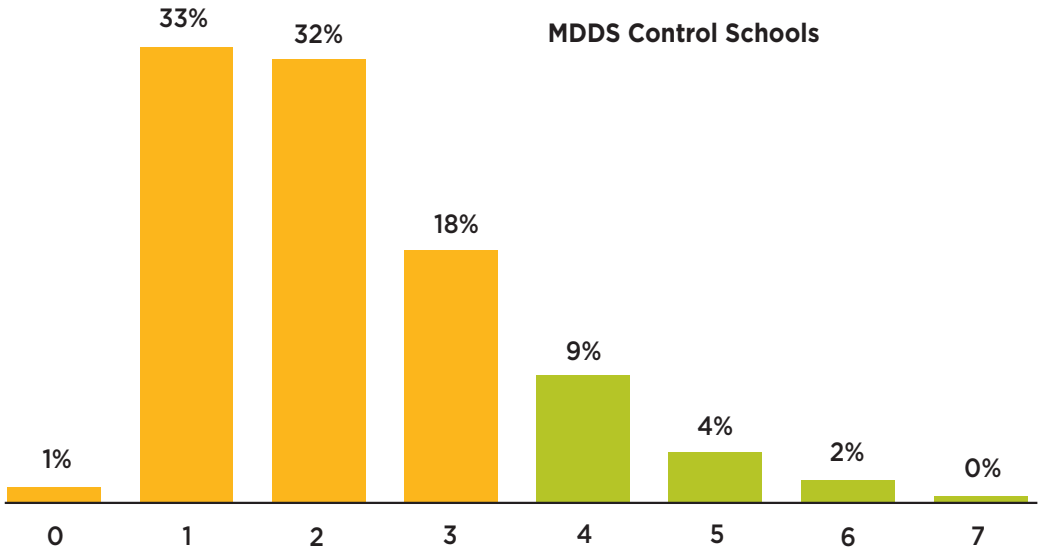


Figure 3.2 Percentage of Children Who Consume Zero, One, Two, Three, Four, Five, Six or Seven Food Groups Per Day in Control Schools



children, followed by vitamin A foods (26%), dairy (24%), and eggs (5%). Figure 3.3 summarizes food group consumption of school meals benefiting children.

On the other hand, 79% of benefiting students reported not consuming roots and tubers, 56% did not consume legumes, 64% reported no other fruits and vegetables eaten, and 38% did not consume any flesh foods in the past 24-h. Figure 3.4 summarizes the percentage of student who report not having consumed selected food groups.

The majority of children from both intervention (62%) and control (57%) schools reported consuming flesh foods in the past 24-h. Dairy consumption was higher among children attending control schools (42%) than children from intervention schools (24%). Only a small number of children reported having consumed eggs in the past 24-h, 4% of children from control schools and 5% from intervention schools. Figure 3.5 summarizes the percentage of students who report having consumed animal source foods in the past 24-h.

Figure 3.3 Percentage of Benefiting Children Consuming Selected Food Groups in the Past 24-h.

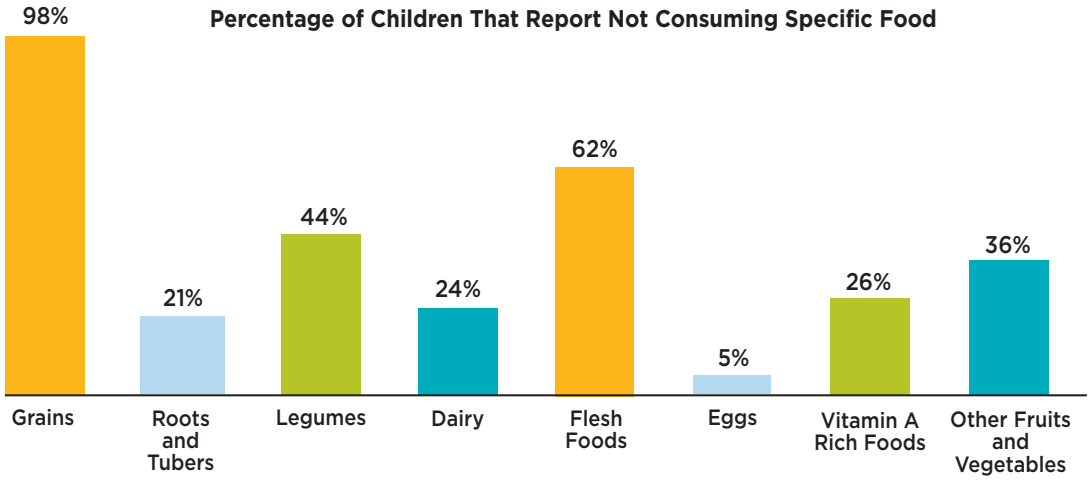
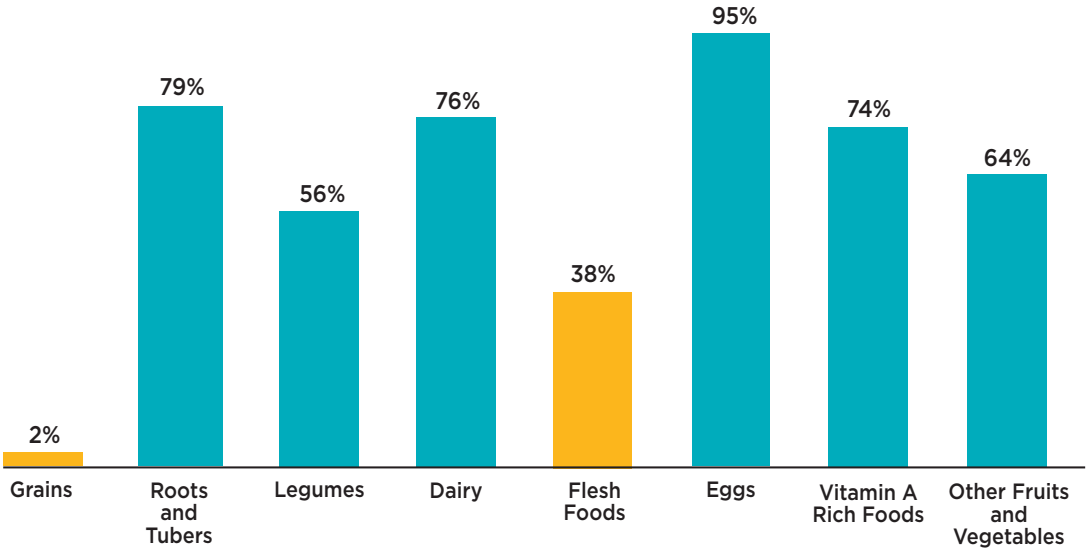


Figure 3.4 Percentage of Intervention Students Who Reported Not Consuming Selected Food Groups in the Past 24-h.



A small percentage of intervention children (21%) reported intake of roots and tubers, followed by 15% of control children. A larger number of intervention students reported having consumed legumes (44%) followed by (34%) of control students. Figure 3.6 summarizes the percentage of students who report having consumed roots, tubers, legumes, and nuts.

Figure 3.5 Percentage of Intervention and Control Students Who Reported Consuming Animal Source Foods in the Past 24-h.

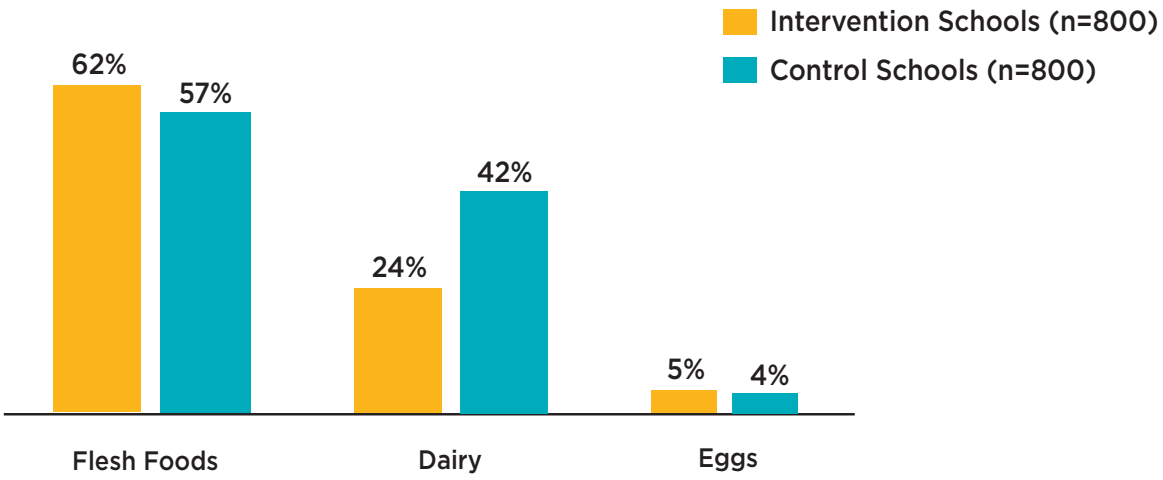
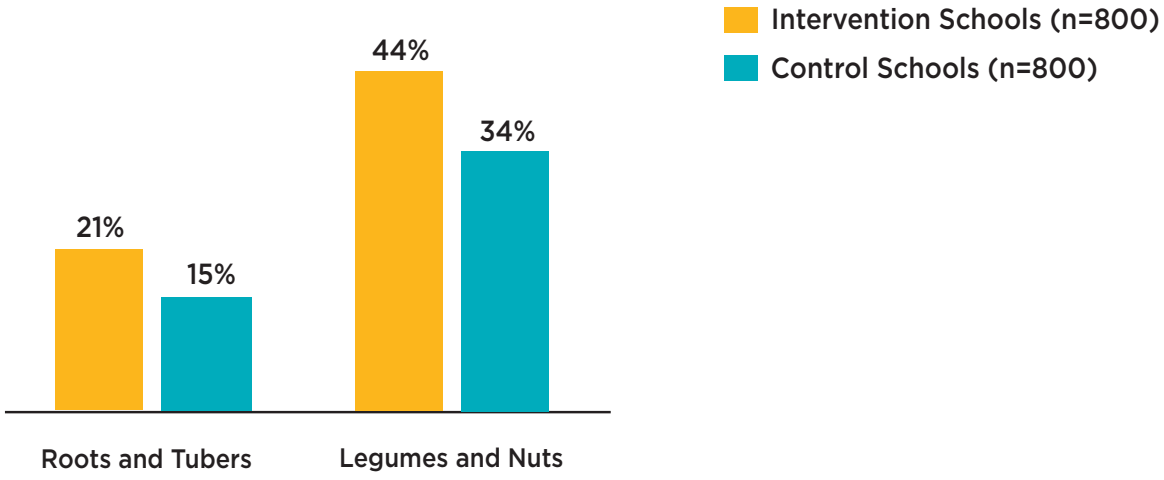


Figure 3.6 Percentage of Intervention and Control Students Who Reported Consuming Roots and Tubers or Legumes and Nuts in the Past 24-h.



Most of the children (98%) reported grain consumption. On the other hand, only 28% of control students reported intake of vitamin A rich foods, followed by 26% of intervention children, and the majority of children did not consume any other fruits and vegetables. Figure 3.7 summarizes the percentage of students who report having consumed vitamin A rich foods or other fruits and vegetables. Lastly, Figure 3.8 summarizes the percentage of students from each group who reported having consumed at least 3 food groups in the past 24-h. Only 9% of control and 8% of intervention students reported consuming 4 food groups in the previous day.

Figure 3.7 Percentage of Intervention and Control Students Who Reported Consuming Vitamin A Rich Foods or Other Fruits and Vegetables in the Past 24-h.

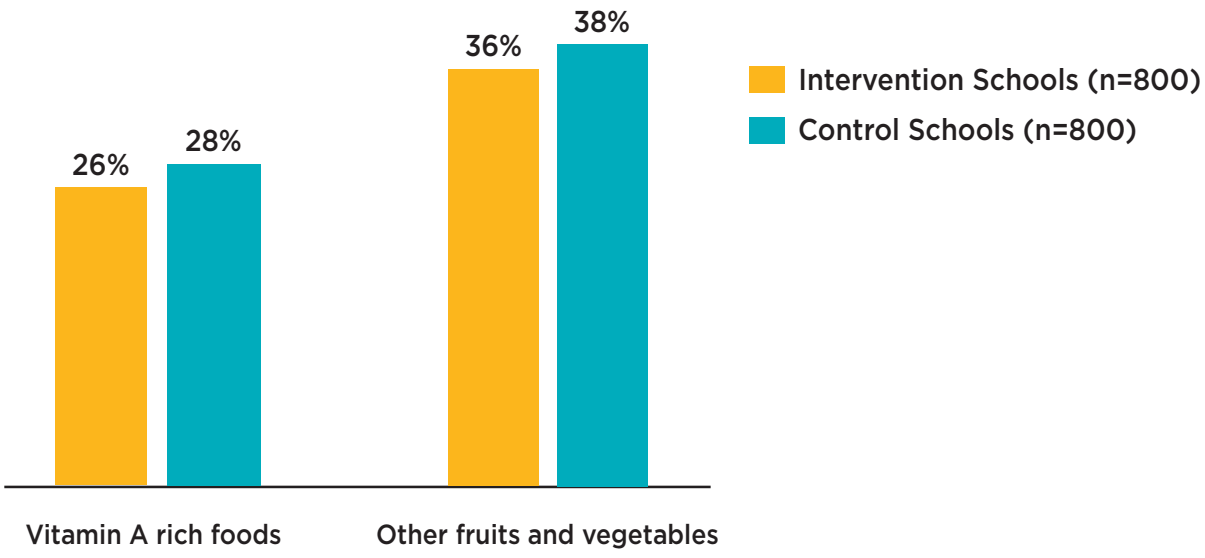
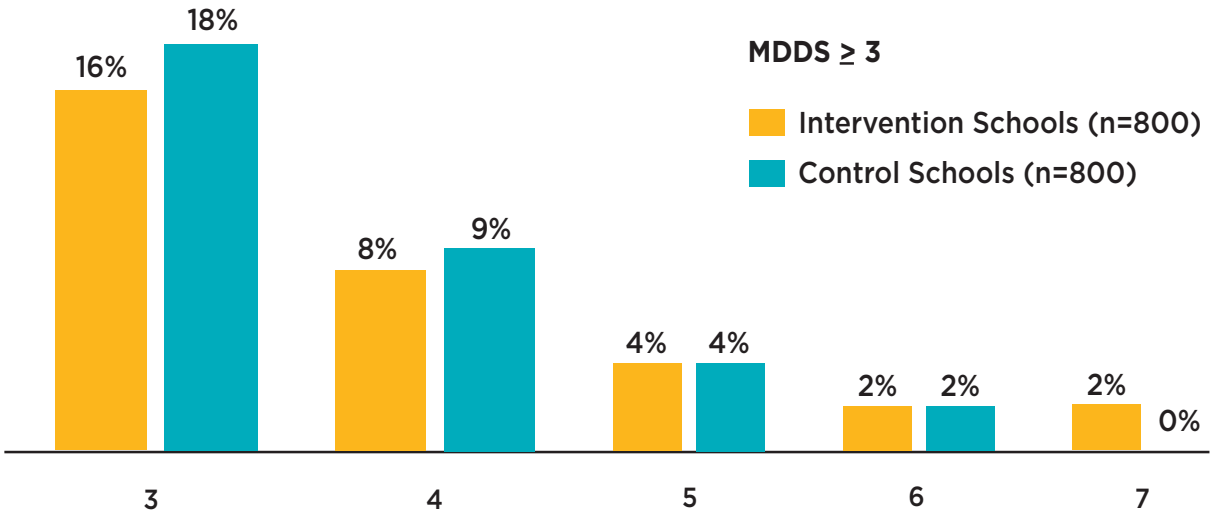


Figure 3.8 Percentage of Intervention and Control Students Who Reported Consuming Three or More Food Groups in the Past 24-h.



Midline Intervention Results

Student Characteristics

To monitor progress achieved and to make judgment of the effectiveness of the school meals intervention in improving the diet quality of beneficiary students, midline data was collected. A total of 2388 students were randomly selected to participate in the 24-hours recall minimum dietary diversity questionnaire. Although the same districts (Bunda, Musoma Rural, Butiama, and Serengeti) were chosen for the formative evaluation, only students from 6th and 7th grade participated in the study. A total of 1200 benefiting children were selected from Bunda, Butiama, and Musoma Rural districts, and 1188 non-benefiting children from Serengeti district. Table 3.26 shows the student midline distribution based on location.

Half of the students were enrolled in sixth grade and half in seventh grade (37.7%). There was an even distribution of boys (50%) and girls (50%).

Table 3.26 Student Distribution Based on Location

District	Number of Subjects	Percent
Bunda	288	12%
Butiama	528	22%
Musoma Rural	384	16%
Serengeti	1188	50%
Total	2388	100%

Half of the subjects were enrolled in 6th grade and half in 7th grade. (37.7%). There was an even distribution of boys (50%) and girls (50%) subjects.

Figure 3.9 Percentage of Intervention Group Children Consuming Each Number of Food Groups Per Day

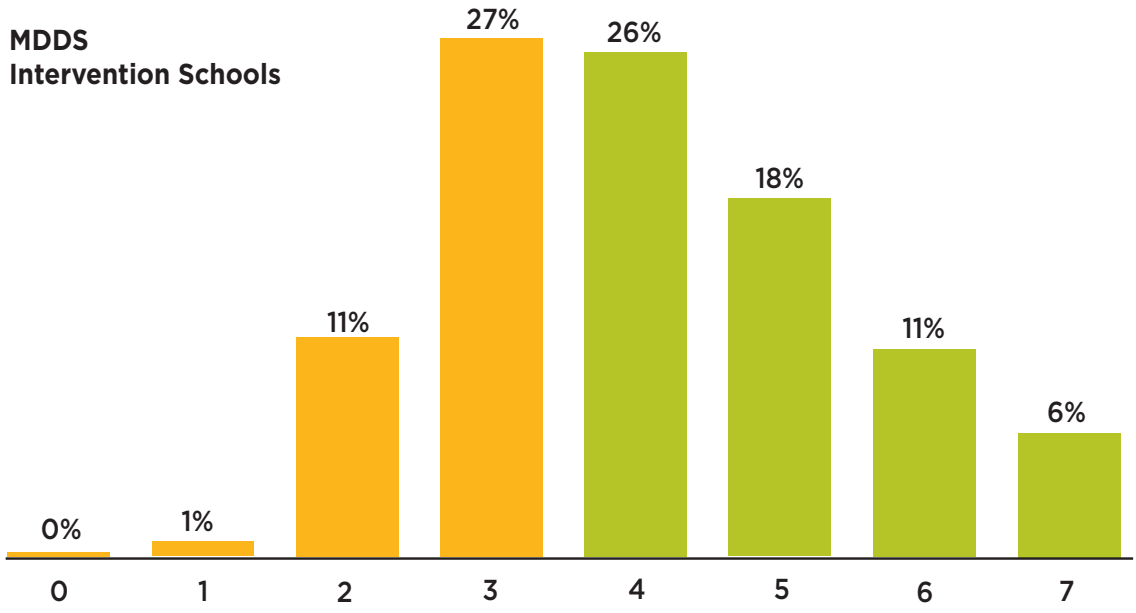
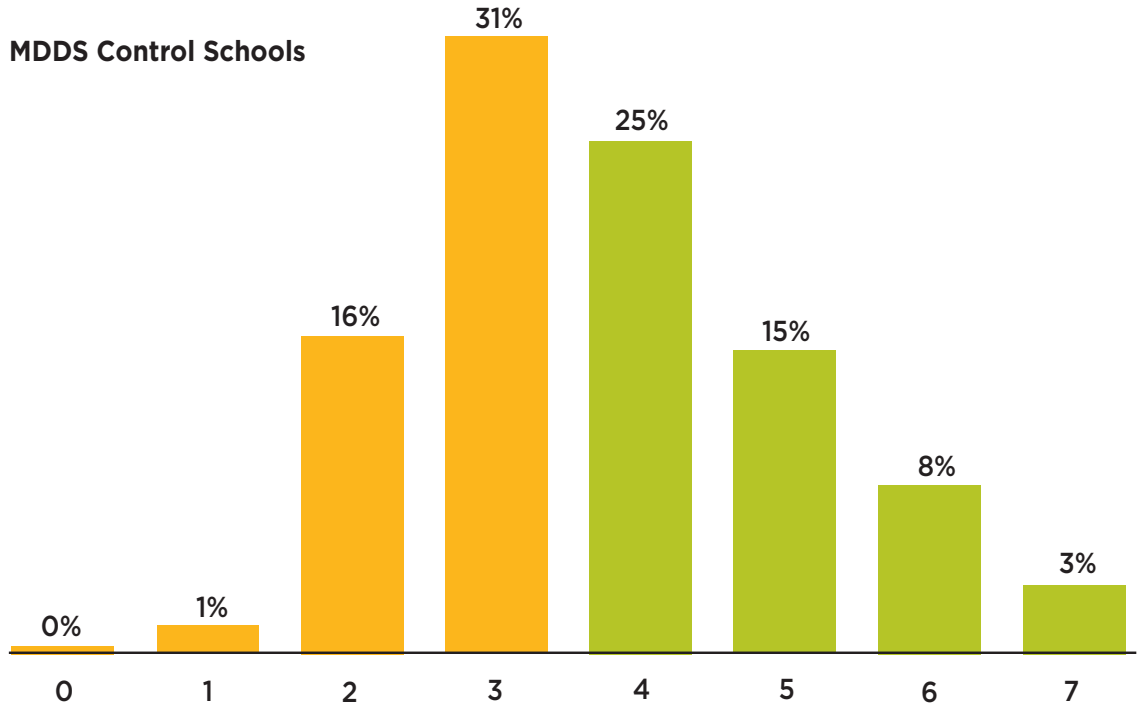


Figure 3.10 Percentage of Control Group Children Consuming Each Number of Food Groups Per Day



Dietary Diversity

The majority of children, from both intervention and control schools, reported consuming at least four food groups in the past 24-h. As many as 58% of children reported adequate dietary diversity. In comparison, at baseline, as few as 19% of children had reported consuming four food groups in the past 24-h. This is a substantial increase in the number of school-age children that reported having adequate dietary diversity. A higher number of students (61%) of intervention children reported consuming four or more food groups per day,

Table 3.27 Mean Number of Food Groups Consumed Per Day, Intervention vs Control Groups

District	N	No. of Food Groups	Standard Deviation
Control	1188	3.75	1.351
Intervention	1200	4.07	1.403

Table 3.28 Mean Number of Food Groups Consumed Per Day by District

District	N	No. of Food Groups	Standard Deviation
Bunda	288	3.91	1.368
Butiama	528	4.11	1.365
Musoma Rural	384	4.13	1.473
Serengeti	1188	3.75	1.351
Total	2388	3.91	1,386

Table 3.29 Mean Number of Food Groups Consumed Per Day, Boys vs Girls

District	N	Mean No. of Food Groups	Standard Deviation
Boys	1188	3.85	1.364
Girls	1200	3.96	1.406

with 31% of students consuming five food groups or more. Figure 3.9 and Figure 3.10 summarize these findings.

The mean number of food groups consumed per day for intervention group children was significantly higher than for control group children. Table 3.27 summarizes the findings.

When segregating the data at the district level, Musoma Rural had the highest mean number of food groups consumed per day, followed by the Butiama and Bunda districts. Children from the Serengeti district reported the lowest mean number of food groups consumed per day. Table 3.28 reveals findings.

When comparing the dietary diversity of boys and girls, we see that boys tended to have less dietary diversity than girls.

The majority of intervention group children reported consuming grains (99.7%), fish or meat (88%), legumes and nuts (67%), and other fruits and vegetables (61%). As many as 40% of benefiting children reported having consumed dairy in the past 24-h. Vitamin A rich foods were consumed by 37% of intervention children. Figure 3.11 summarizes food group consumption of school meal benefiting children.

When looking at food groups that were not consumed in the past 24-h, 85% of benefiting students reported not consuming eggs, 63% did not consume Vitamin A rich foods, and 60% reported no dairy products eaten.

Figure 3.11 Selected Food Group Consumption in the Past 24-h.

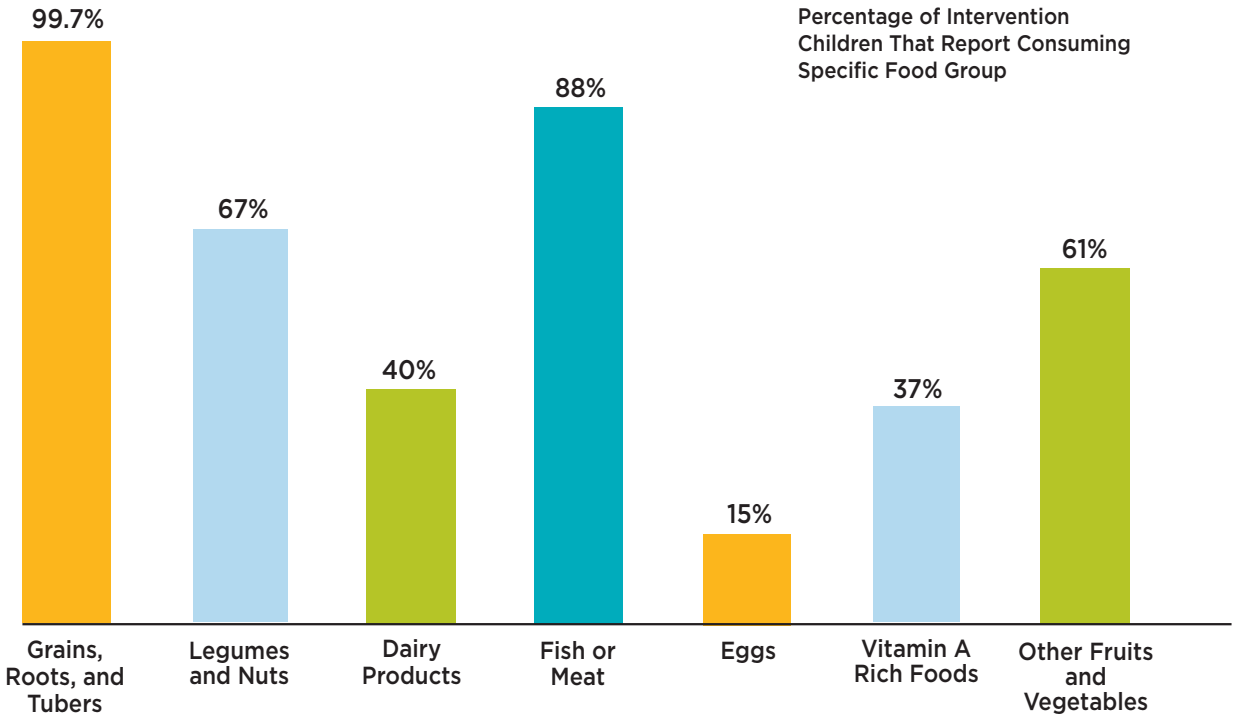


Figure 3.12 Selected Food Groups Not Consumed in the Past 24-h.

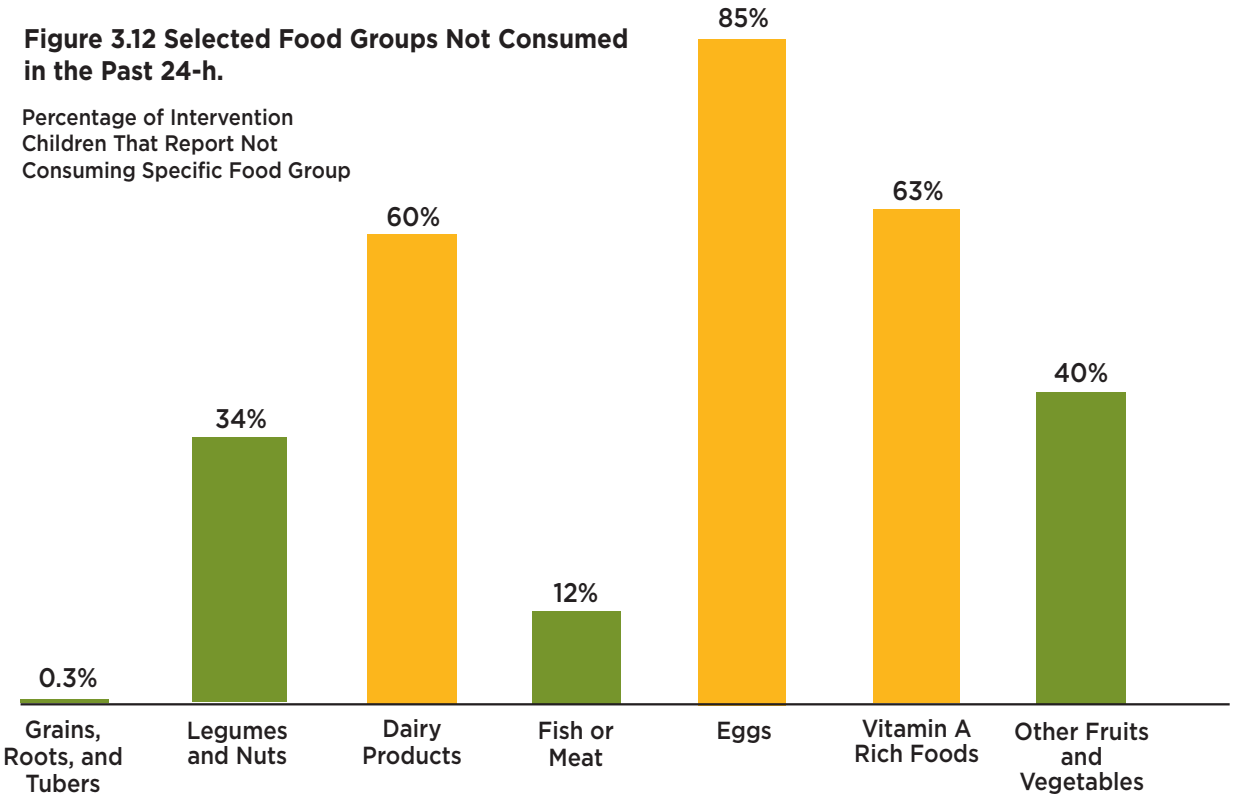
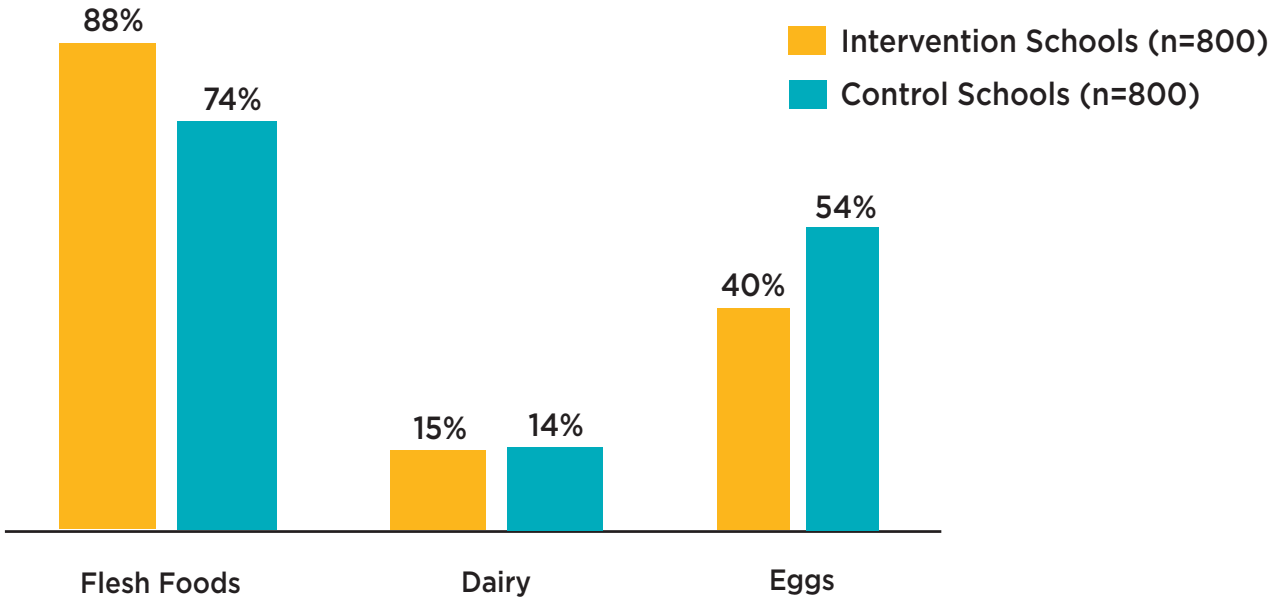


Figure 3.12 summarizes the percentage of students who report not having consumed selected food groups.

A greater number of children from both intervention (88%) and control (74%) schools reported consuming fish or meat in the past 24-h. Egg consumption was higher among children attending control schools (54%) than children from intervention schools (40%). Few children reported having consumed dairy in the past 24-h, 15% of children from intervention schools followed by 14% from control schools. Figure 3.13 summarizes the percentage of students who report having consumed animal source foods in the past 24-h.

When analyzing dietary diversity data by district, 61% of intervention children attending schools in the Musoma Rural district reported four or more food groups consumed. As many as 63% of children attending schools in the Butiama district reported consuming four or more food groups, followed by 59% of children from Bunda district. Figures 3.14 through 3.16 summarize the number of food groups consumed by children each day by district.

Figure 3.13 Intervention and Control Students Who Reported Consuming Animal Source Foods in the Past 24-h.



On the other hand, 51% of control children from Serengeti district reported having eaten a minimum of four food groups, with 31% of children having consumed only three food groups. Figure 3.17 displays the number of food groups consumed by control children attending schools in the Serengeti district.

Figure 3.14 Percentage of Children Consuming Each Number of Food Groups Per Day, Intervention Children from Musoma Rural District

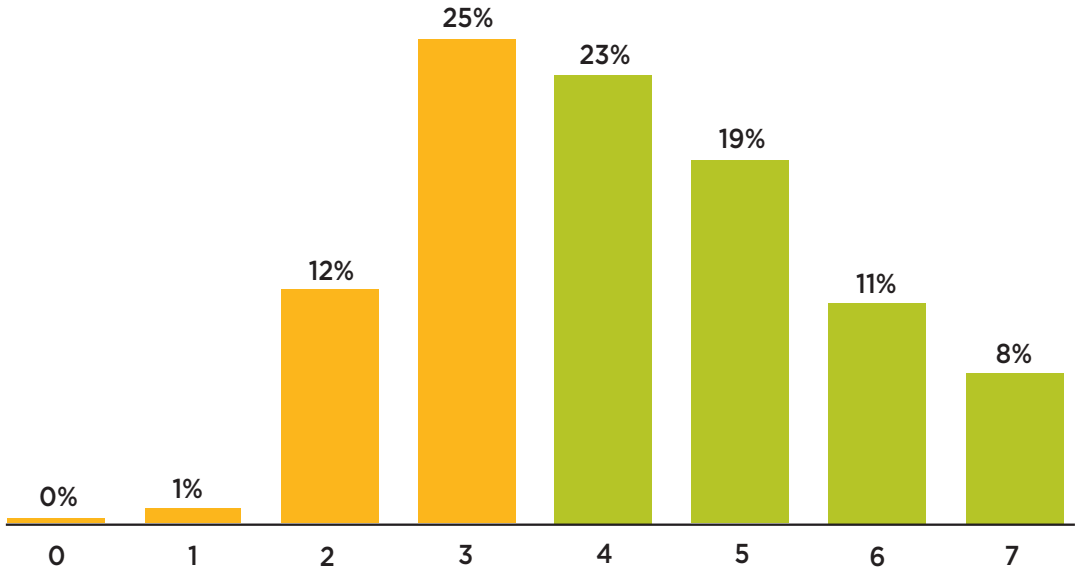


Figure 3.15 Percentage of Children Consuming Each Number of Food Groups Per Day Intervention Chlldren from Bunda District

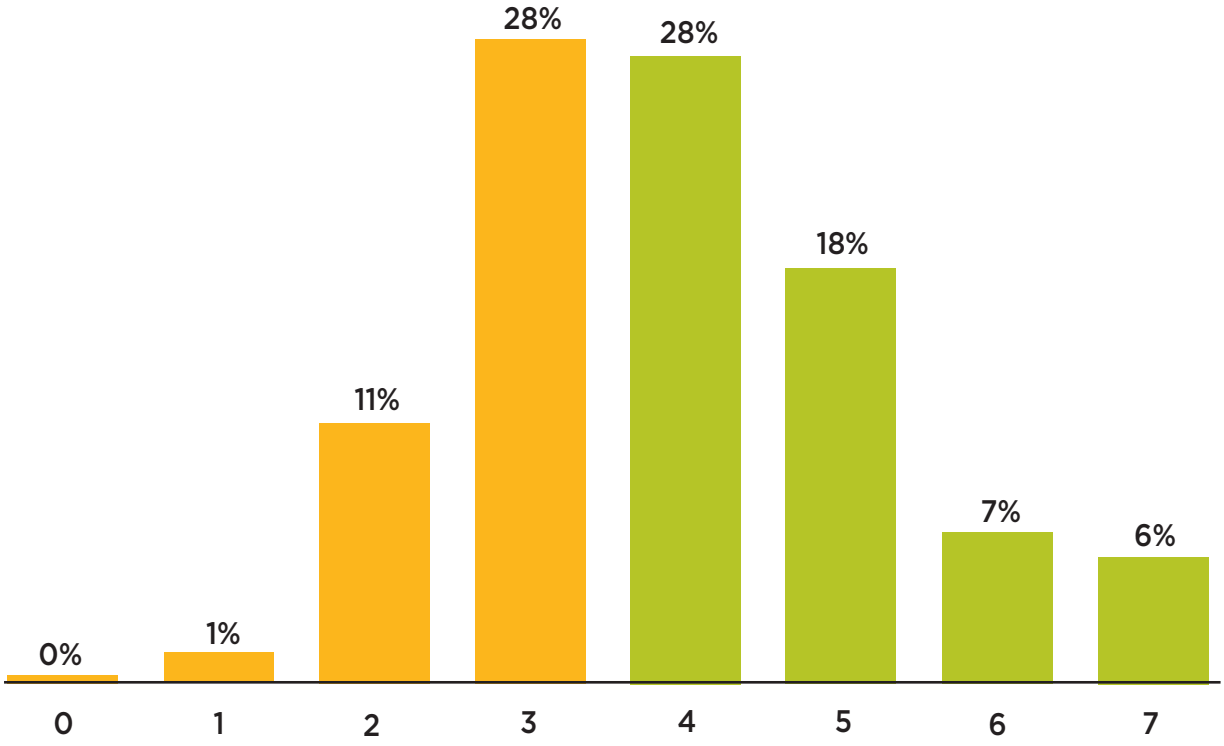


Figure 3.16 Percentage of Children Consuming Each Number of Food Groups Per Day, Intervention Children from Butiama District

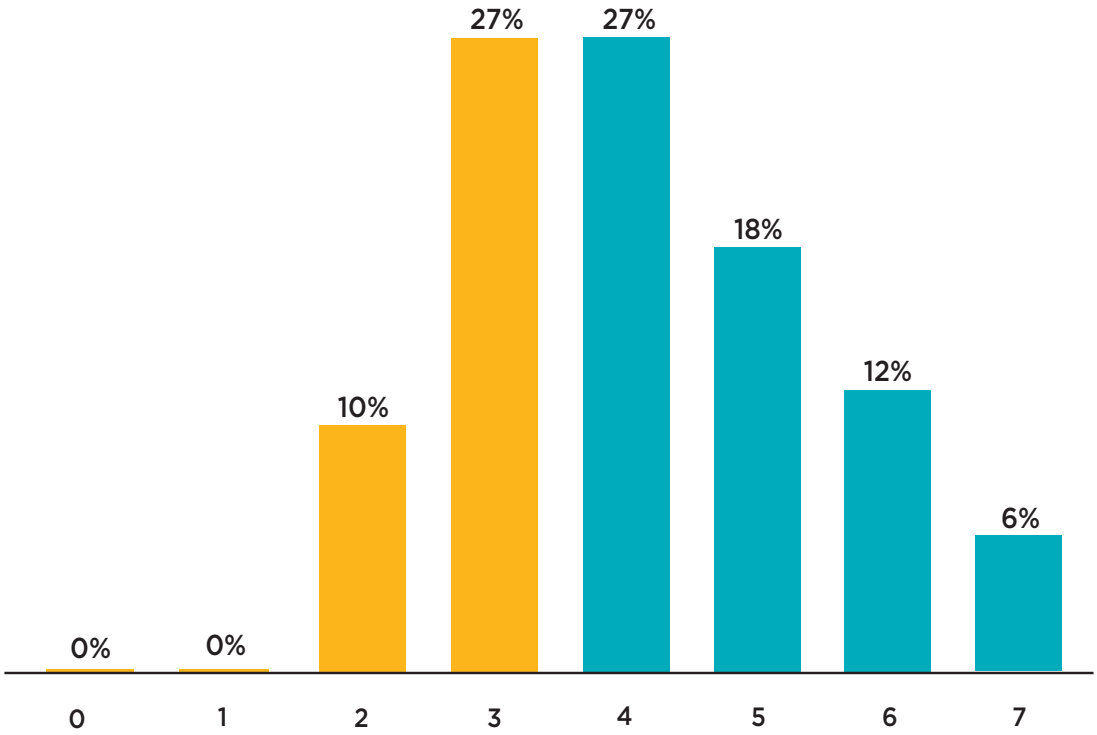
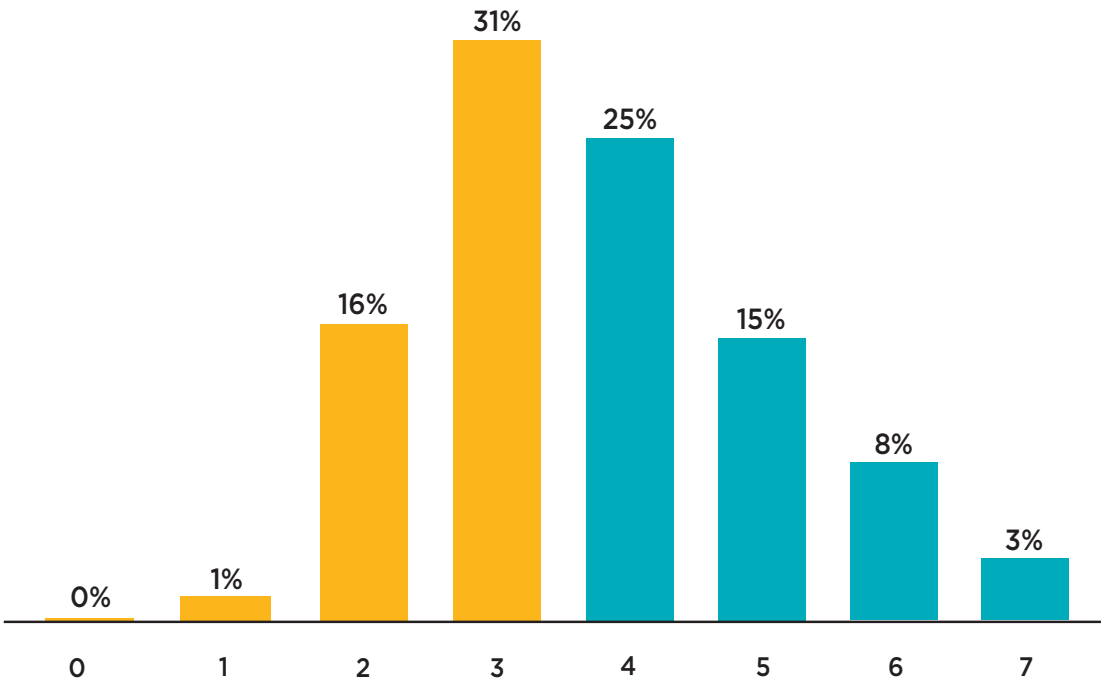


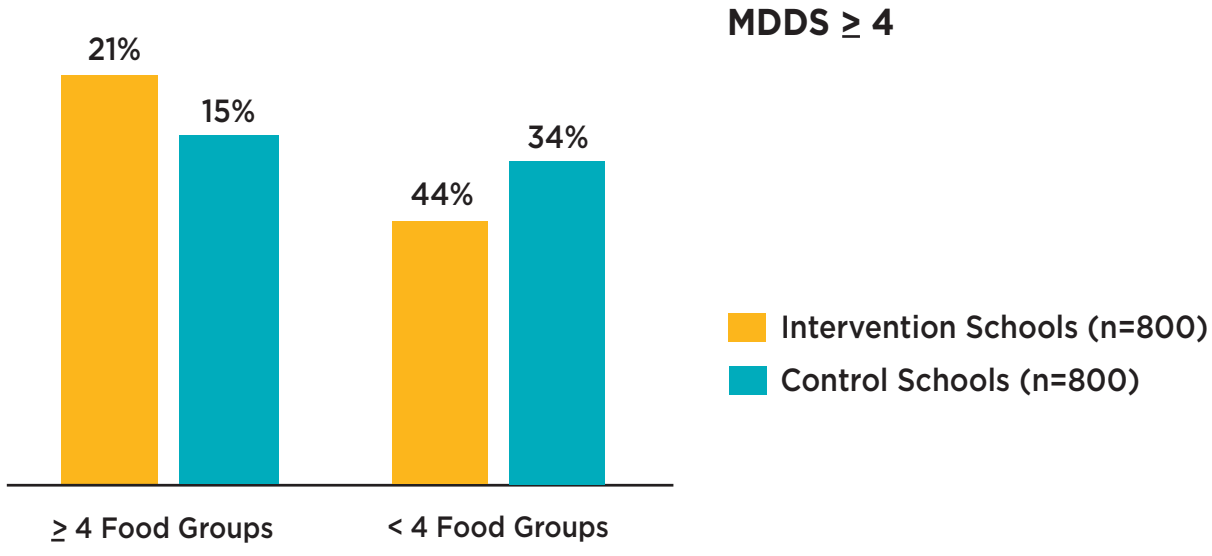
Figure 3.17 Percentage of Children Consuming Each Number of Food Groups Per Day, Serengeti District Control Group Children



Finally, Figure 3.18 summarizes the percentage of students from each group who reported having consumed at least four food groups in the past 24-h. A higher percentage of intervention children (61%) compared to control children (52%) reported consuming a minimum of four food groups.

When looking at children consuming foods from less than four food groups per day, 39% of intervention and 48% of control students reported having consumed three or less food groups.

Figure 3.18 Intervention vs Control Students Consuming Four or More Food Groups in the Past 24-h.



Discussion and Conclusion

Nutrition Adequacy

The MGD program school meals that were provided in Tanzania are portioned to provide at least 20% of the RDA of many of the key nutrients that are essential for children to prevent malnutrition and enhance health and development. The meals do contain less fat than recommended based on the available information, though, they contain adequate calories, protein, and carbohydrates. It should be considered whether meals could be better balanced by providing more fortified oil, which would increase the vitamin D and fat content. Each meal is designed to provide the most optimal nutrition for those receiving the food, by pairing carbohydrate, protein, and fat sources together. However, the ingredients also need to be portioned so that the children can maximally benefit. Finally, the foods provided are low in a few important nutrients, notably, vitamin C and calcium, of which each meal would ideally provide 30% of the RDA of in order to meet MGD requirements. One thing to look at may be whether locally procured foods are a good source of vitamin C, vitamin B12, calcium, protein, or fat, to determine whether or how much of the gap could be filled by these foods.

Dietary Diversity

The diet of students from both intervention and control groups is comprised of mostly grains, legumes, and flesh foods. Almost all students (99%) reported consuming grains in the past 24-h. Data findings are consistent with the results of the national nutrition profile report which states that the population of Tanzania follows a diet centered on cereals and pulses with minimal consumption of micronutrient dense foods such as fruits and vegetables (FAO, 2008). The dominant consumption of cereals is highly attributed to minimal levels of seasonal price variations among these longer shelf-life goods as opposed to high price variations of perishable fruits and vegetables (FAO, IFAD, UNICEF, WFP and WHO, 2020). This is not unique to the population of Tanzania, as lower-middle income countries often lack sufficient supplies of fruits and vegetables for all individuals to meet the WHO recommendations of adequate dietary practices, which includes a minimum consumption of 400 g or more of fruits and vegetables each day (Siegel et al., 2014). This is a global scale matter as many people are unable to afford the lowest-cost form of nutritious diets as food items that are nutrient-dense are often more expensive and less readily available (FAO, IFAD, UNICEF, WFP and WHO, 2020). This is concerning as a lower consumption of fruits, vegetables, and other nutrient-dense foods is associated with diminished health and increased risk of noncommunicable diseases (NCDs) (FAO, IFAD, UNICEF, WFP and WHO, 2020). Recent data on the geographical distribution of seasonality in diet costs within Tanzania also reveals that animal-source foods had the least seasonality (FAO, IFAD, UNICEF, WFP and WHO, 2020). These findings are important as including animal-source foods could contribute to improvements in overall dietary diversity scores of the population due to a relatively stable supply and lower-cost (FAO, IFAD, UNICEF, WFP and WHO, 2020). Additionally, animal source foods are a high-quality source of protein and several micronutrients. When investigating the consumption of animal-source foods among intervention and control students, we see that the majority of intervention (88%) and control (74%) children reported consuming animal-source foods in the previous 24-h, therefore, further confirming the high availability of these food items.

Findings on the dietary diversity of students, from both intervention and control groups, reveal that the majority of children reported consuming at least four food groups in the previous day, with as many as 61% of intervention and 51% of control students consuming four or more groups. At baseline, most children were at a high risk for nutrient deficiencies and likely to be consuming inadequate amounts of several micronutrients due to the reported mean number of food groups consumed per day of 3.15 ± 1.4. However, the midline data revealed that the percentage of at-risk students decreased substantially, as the majority of children from both groups reported increased food group consumption. Although the risk for nutritional deficiency is reduced with increased diet variety, consuming the minimum number of four food groups is not optimal. Currently, there is no established consensus and recommendations regarding the minimum number of food groups that school age children should consume (Allen et al., 2006). However, a larger number of food groups is desirable and more likely to meet daily nutrient requirements. (Arimond & Ruel, 2002) Children who consume a cereal-based diet that lacks fruits, vegetables, and dairy have been identified as having a low nutrient intake, with a probability of nutrient adequacy that falls below 75 % for all nutrients (Gewa et al., 2013). As many as 60% of intervention children

reported no dairy consumption, and 40% stated no fruits or vegetables were consumed in the past 24-h.

The midline data revealed the school meals intervention contributed to a one unit increase in the overall number of food groups consumed per day, therefore increasing the likelihood that benefiting children are receiving adequate nutrition. A one unit increase in each overall dietary diversity score has been associated with a significant increase in nutrient adequacy (Gewa et al., 2013). However, a dietary diversity score of 6 to 8 food groups has been associated with the lowest risk of micronutrient insufficiency (Zao et al., 2017). As few as 37% of benefiting children reported consuming Vitamin A-rich foods. A total of 61% of intervention students consumed other fruits and vegetables in the past 24-h. Dairy was consumed by 40% of benefiting students, and as little as 15% of students consumed eggs. Although significant improvements have been achieved with the school meals intervention, most children displayed less than optimal dietary diversity scores, and a diet based heavily on grains and flesh foods and lacking fruits, vegetables, and dairy.

Limitations

A limitation of this report is the limited data available on specific school feeding practices pertaining to recipes and serving sizes of meals. Although there is detailed data on the food commodities provided by the USDA, there are no recipes and menus provided by the school district that can currently be assessed. The supplementary material provided by staff in Tanzania includes the findings of the nutritional analysis that includes the micronutrient and fiber content of one meal. If there is other food being provided to the children that information would be useful to best give an accurate analysis of the school meals in Tanzania.

This report only considers foods consumed in the previous 24-h. Therefore, it does not consider daily diet variability, and it is not a thorough representation of the actual intake of participants. One way to improve the assessment of the student's nutritional intake would be to conduct three or more 24-h recalls on the same students over a period of several days (Sempos et al, 1985; FNB, 1986). Additionally, 24-h recall reports should be conducted in different seasons to account for the seasonality of food items (Sempos et al, 1985). Food insecurity in Tanzania has been reported to peak from the months of December through February and to be lower during the months of June through August (Rogawaski et al., 2019). The data to support this report were collected during the months of April and May, which might have contributed to the lower mean number of food groups consumed per day seen among students from both control and intervention groups. Moreover, at the time of the study, school meals were comprised of USDA-commodities only.

Starting in 2020, the school feeding program shifted to a community led school feeding initiative in which benefiting students were able to receive a wider variety of foods from community contributions and the newly implemented school garden initiative. Contributions including orange flesh sweet potatoes, fruits, and green vegetables have been offered to benefit children. Therefore, increasing the dietary variety benefits children and contributing to potentially greater dietary diversity. On the other hand, COVID-19 has caused disruptions in the FFE program and will continue to have substantial effects on the availability of school meals to benefit children. Closures of schools have decreased children's access to school meals and nutritious foods. In June-July 2020, PCI conducted a rapid situational analysis on the impact of COVID-19 restrictions on the school feeding program, which revealed "a low yield of school gardens and farms. Currently, only 6 out of 28 extension officers reported to have school garden existing and 18 reported school farming existing. Only 6 schools are keeping seeds for the coming season. Furthermore, 10 parents out of 53 reported that covid-19 pandemic has affected availability of food at household level now and will continue to have a negative effect in the future. Additionally, 36 (68%) out of 53 reported observable changes in farmer group dynamics as a result of covid-19 pandemic in meeting frequency, attendance and group production."

Overall, school meals provided for students in Tanzania are a source of calories and many key nutrients important for growth and development based on the meal data available. However, there is room for improvement in the supply of some nutrients to the students. Those improvements could include higher quantities of calcium, Vitamin C, vitamin B12, and calories from fat in the provided meals.

Evaluate the impact of school meal programs

Sub-section 3 of component 3 is an evaluation of the impact of school meal programs in Senegal and Tanzania as it relates to providing adequate nutrition for cognitive development, normal growth and development, and improving educational outcomes. To do this, results from component 3 sub-section 1 and component 3 sub-section 2 of this study were compared.

To address the research question under component 3, the MSU team first conducted three in-depth desk reviews of current literature. These desk reviews examined nutrients associated with cognitive development[1], nutrients associated with stunting[2], and the relative impact of school meal programs on educational outcomes for preschool-age children[3]. Sub-section 2 of research component 3 then entailed evaluating what specific foods and nutrients are provided as part of the school meals, as well as the frequency of meals and adequacy of nutrient content. Below, conclusions from this comparative evaluation are broken down by desk review topic.

1 Roberts, M.; Tolar-Peterson, T.; Reynolds, A.; Wall, C.; Reeder, N.; Rico Mendez, G. The Effects of Nutritional Interventions on the Cognitive Development of Preschool-Age Children: A Systematic Review. Nutrients 2022, 14, 532. https://doi.org/10.3390/nu14030532

2 Wall, C., Tolar-Peterson, T., Reeder, N., Roberts, M., Reynolds, A., Rico Mendez, G. The Impact of School Meal Programs on Educational Outcomes in African Schoolchildren: A Systematic Review. International Journal of Environmental Research and Public Health 2022, 19 (6), 3666. https://doi.org/10.3390/ijerph19063666

3 Manuscript is under review in a peer-reviewed journal.

Cognitive Development

Adequate intake of energy, protein and certain micronutrients are essential for the cognitive development of preschool and primary school age children (Welsh, 2010). Children who do not consume adequate amounts of calories display impaired brain development and are more likely to underachieve academically in later years (Welsh, 2010). Protein-energy malnutrition during preschool years can impair adequate brain development and growth (Grantham-McGregor). Furthermore, vitamin B12 deficiency has been linked to neurological disorders as vitamin B12 plays an important role in neurotransmitter synthesis and functioning (Dror, 2008; Winje, 2018). Additionally, nutrients such as iron and long-chain polyunsaturated fatty acids (LC-PUPFAs) have been identified to be particularly relevant to the cognitive development of preschool and primary-school age children. Iron plays an essential role in the development of neurological pathways in the brain, and iron-deficient children display impaired overall intelligence (Monk, 2013; Abbaspour, 2014). Docosahexaenoic acid (DHA) and Eicosatetraenoic acid (EPA) are essential LC-PUPFAs required for adequate brain development (Weiser, 2016). Inadequate intake of these essential fatty acids can negatively affect neurodevelopment and memory skills of children (Weiser, 2016; Bourre, 2004).

The school meals given to beneficiary children in Tanzania and Senegal provide adequate calories, protein, and carbohydrates. Though, the meals are lacking certain nutrients important to support cognitive development such as the essential fatty acids DHA and EPA, vitamin B12, vitamin C, and iron. Recommendations to improve school meals based on research findings include:

Target nutrients of concern: Iron and vitamin B12

1. Optimize iron absorption by increasing the vitamin C content of meals
2. Soak foods high in phytic acid, such as beans, in water prior to cooking to reduce the phytic acid content and thus improve nutrient absorption.
3. Diversify school meals served to provide heme and non-heme iron food sources and adequate vitamin B12

Currently, non-heme iron makes up 100% of the iron content of school meals provided to children in Tanzania and Senegal. Non-heme iron is found in plant sources such as legumes and beans. Non-heme iron absorption is dependent on the composition of the meal provided and by the iron status of the person consuming the meal (Bourre, 2004). Therefore, non-heme iron is less bioavailable to the body as its absorption is dependent on other food components (Bourre, 2004). On the other hand, the bioavailability of heme iron found in the hemoglobin and myoglobin of meats and other animal products is minimally influenced by food components and iron status (Bourre, 2004). To optimize nonheme iron absorption, school meals require vitamin C, as vitamin C increases non-heme iron absorption. The following are examples of fruits and vegetables that could be added to daily school meals to promote increased iron absorption: oranges, grapefruit, peppers, kale, tangerines, limes, lemon, strawberries, pineapple, papaya, guava, honeydew, and tomatoes.

It should be noted vitamin C is a water-soluble vitamin that can be easily destroyed by heat and light (Lynch, 1980). Therefore, fruits and vegetables should be offered raw or after undergoing minimal cooking at low temperatures, as vitamin C is easily degraded during the cooking process and by elevated temperatures (Lynch, 1980). Cooking techniques such as boiling, blanching, steaming, and microwaving have been found to degrade the vitamin C content of foods (Lynch, 1980). Using minimal cooking water and cooking for shorter amounts of time can assist with the retention of vitamin C content of foods, and steaming has been found to be a superior cooking technique than boiling and blanching (Lynch, 1980).

Another aspect of school meals that hinders iron absorption is the phytic acid content of cereals, legumes, and certain beans that are currently offered to children daily. Phytic acid is considered an antinutrient because it binds to certain minerals, therefore inhibiting absorption of these minerals by the body (Hurrell, 2004; Hallberg, 1989). Phytic acid has been found to inhibit iron, zinc, calcium, magnesium, and manganese absorption (Reddy, 1982; Bohn, 2004; Phillippy, 2006; Greiner, 2006; Gupta, 2015; Lee, 2017). Though several methods have been found to be effective at reducing the phytic acid content in foods, therefore improving the nutritional value of foods high in phytic acid (Lynch, 1980; Gupta, 2015). When legumes and cereals are soaked in water overnight or for several hours, complete dephytinization occurs leading to increased iron and other mineral absorption (Bourre, 2004). High phytic acid foods include lentils, peas, beans, millet, rice, barley, wheat, rye, sorghum, and nuts and seeds.

Therefore, it is strongly recommended that the cereals, legumes, and other foods high in phytic acid offered to beneficiary children in school meals to be soaked in water overnight or for several hours. The soaking method should involve the complete submergence of foods in water at temperatures between 45 and 65 °C and pH value between 5 and 6 (Greiner, 2006). Sprouting and fermentation techniques are also effective at destroying phytates in foods and can be feasible alternative techniques (Lynch, 1980).

Due to the increased bioavailability of heme iron found in red meat, poultry, and seafood, an alternative option would be to add animal foods to school meals. Meat and fish are good sources of heme iron, which is more bioavailable to the body (Lynch, 1980). Furthermore, meat and fish have been identified to have the same effects in non-heme iron absorption as vitamin C and found to also enhance iron absorption (Lynch, 1980). Additionally, adding animal foods to school meals would provide children with a reliable source of vitamin B12 which is a nutrient currently lacking in meals. Another alternative option would be to fortify grains and flours served to children with vitamin B12 or to provide children with vitamin B12 supplementation if children do not consume any animal-sourced foods at home. The feasibility of such implementation can be challenging due to environmental, sustainability, and monetary concerns.

Key nutrients of concern: Essential fatty acids Docosahexaenoic acid (DHA) and Eicosapentaenoic acid (EPA)

1. **Adjust meal composition to provide essential fatty acids**
2. **Diversify school meals**

School meals lack dietary omega-3 long-chain polyunsaturated fatty acids (LCPUFA), eicosapentaenoic acid (EPA, 20:5n-3) and docosahexaenoic acid (DHA, 22:6n-3). These are essential fatty acids that play an important role in brain development and vision (Weiser, 2016; Forsyth, 2016). DHA has been identified to play an essential role in the prevention of chronic diseases (Weiser, 2016; Colombo, 2020). Inadequate DHA intake has been associated with significant increase in the development of chronic disease leading to increased morbidity and mortality (Forsyth, 2016). According to the European Food Safety Authority (EFSA), preschool and primary school age children should consume one to two fish meals per week or 250 mg of EPA plus DHA per day (Forsyth, 2016). However, fish intake is drastically lower in low-middle income countries in caparison to high income countries (Forsyth, 2016). Recent data showed that majority of the Tanzania population consume less than the recommended amounts of fish per week (Forsyth, 2016). The median intake of DHA in developing countries is estimated to be 96 mg/day in contrast to 184-473 mg/day intake in developed countries (Forsyth, 2016). There is a direct association between fish intake and the per capita gross national income (Forsyth, 2016). With the lowest income countries displaying the lowest DHA intake (Forsyth, 2016).

Diversifying school meals to provide fish to beneficiary children at least twice a week would improve the nutritional profile of meals and further support cognitive development. Other alternative includes adding omega-3 rich oils to the school meals during the cooking process or prior to serving. The following foods have been identified to be reliable sources of omega-3 fatty acids that could lead to improved nutritional profile of school meals. Omega-3 rich foods include canola oil, sunflower oil, flaxseed oil, soybean oil, hemp oil, fish, salmon, mackerel, herring, sardines, cod, anchovies, chia seeds, flax seeds, walnuts.

The availability of such items is dependent on seasonality and the location of schools. Therefore, the implementation of meal diversification and the addition of omega-3 rich foods to school meals will likely be challenging to implement as adequate DHA and EPA intake is a world-wide problem. Environmental, sustainability, and monetary barriers are likely to hinder the implementation of such efforts (Colombo, 2020).

Stunting

As part of our desk review, we examined macro- and micronutrient intake among children ages 2 and older with and without stunting in sub-Saharan Africa. The strongest nutrient-stunting associations found were with protein. The findings from this review indicate that children who are stunted consume less total protein, as well as essential, and conditionally essential amino acids in their diet. There was also evidence in the literature that dietary fat intake differs between children with and without stunting. Children with stunting had lower serum levels of ARA (a conditionally essential omega-6 fatty acid), linoleic acid (an essential omega-6 fatty acid), total omega-6 fatty acid levels, and lower levels of the conditionally essential omega-3 fatty acid DHA. Micronutrients examined in the studies included in our systematic review were vitamin A, vitamin D, vitamin B12, calcium, zinc, iron, and choline. The findings were mixed for micronutrient intake among children with and without stunting. Though, some of the conflicting findings are likely due to the heterogeneity of the articles included in the systematic review. This review found that children with stunting consumed less of many nutrients that are commonly found in animal-sourced foods such as meat, fish, poultry, dairy, and eggs. These foods not only provide protein and each of the essential amino acids, but they also contain essential fatty acids, calcium, vitamin B12, choline, and riboflavin.

In Senegal, the meals provided in primary schools contain 100g of either rice or flour, 25g lentils or split peas, 20g of bulgur, and 10g of oil. In the pre-primary schools, the meals contain 60g of either rice or flour, 25g or 45g of lentils, or 25 or 45g of split peas, and 10g of oil. In Tanzania, the meals contain 120g of maize, 30g of beans,

and 5g of oil. Of note is that these meals do not contain any vitamin B12. Vitamin B12 is found in foods of animal origin such as beef, chicken, fish, milk and cheese. Plant-based foods such as cereals and grains can be fortified with vitamin B12, though, to the best of our knowledge, no ingredients provided in these meals are fortified with vitamin B12. However, importantly, the oil provided in these meals is fortified with both vitamin A and vitamin D.

In many LMIC communities, including those in Senegal and Tanzania, diets are largely plant-based and intakes of animal-sourced foods, particularly milk and meat, are limited. The large volume of a plant-based diet results in a lower energy intake and lower nutrient density intake. For young children who are unable to consume a large volume of food in a single meal, this can result in consuming an inadequate quantity of nutrients in a single meal. In order to best promote healthy growth and development throughout childhood and adolescence, children who are beneficiaries of the school feeding programs would benefit from increased intake of foods such as fish, meat, dairy, poultry, and eggs, as is culturally and economically appropriate.

Educational Outcomes

Education is a key factor in developing skills needed to succeed in life. Millions of children are not enrolled in school, but even those who are in school are not learning sufficiently (World Bank, 2021). Attaining an education can lead to improvements in socioeconomic status and lower the prevalence of poverty (King, 2015). School feeding programs are one method being used to motivate parents to enroll and encourage their children to attend school (Kazianga, 2012). School feeding programs also have the potential to improve cognitive abilities and educational outcomes by providing vital micronutrients (Roberts, 2022). Alleviating hunger during the school day may also increase a child's capacity to concentrate (World Bank, 2012).

Beneficiary programs like MGD FFE utilize defined indicators to measure the impact of the school meals on education and health outcomes. The indicators used by the McGovern Dole program are consistent with the indicators outlined in the broad literature (Wall, 2022). The main outcomes of focus in the literature were academic achievement, attendance, and enrollment. This coincides with MGD S01, MGD 1.3, and MGD 1.3.4 indicators. The main indicator for academic achievement (MGD S01) focuses on literacy outcomes. The indicator is defined as the percent of students that can understand grade level texts after two years of primary schooling. The broad literature does contain studies that look at literacy, but more often academic achievement is assessed by comparing graded assessments. The indicator for attendance (MGD 1.3) is defined as the number of students attending 80% or more of school days. In the literature, attendance rates are calculated using different parameters including days missed and average days attended. The indicator for enrollment (MGD 1.3.4) is defined by the number of students enrolled in supported schools. In the literature, enrollment is typically measured by the percent of eligible children enrolled in schools, or the number of students enrolled in school.

Tanzania

Attendance

Data from a midline evaluation of the McGovern-Dole Food for Education Program indicated that attendance improved in beneficiary schools compared to control schools (Trembley Consulting, 2019). The report shows that the number of children absent due to illness during a two-week period was 3.1% higher in the control schools (Trembley Consulting, 2019). Data collected in the 6-month period prior to the midterm assessment showed that attendance decreased in both treatment and control groups. Still, the treatment group showed 6.5% higher rate of attendance compared to the control group (Trembley Consulting, 2019). In the 2020 fiscal year (FY 2020) data prepared for MSU, attendance increased from baseline to the evaluation in the first half of the year but decreased by the second half (USDA dataset, 2020). The decrease in the second half of the year is a suspected result of the COVID-19 pandemic. Despite the decrease from the first half of the year, the attendance rate in the second half of the year was still higher than

the baseline number with an increase of 18,781 students reaching 80% attendance (USDA dataset, 2020). This data is consistent with the broad literature, as all five of the studies included in a systematic review found benefits to attendance for beneficiary students (Wall, 2022).

Enrollment

According to FY 2020 data prepared for MSU, enrollment increased by 28,057 students from baseline to the second half of the year (USDA dataset, 2020). The measurement was taken at the beginning of March before the school closure due to the COVID-19 pandemic even though the enrollment period officially closed at the end of March. Although the assessment date was early, there was still a clear increase in the number of students enrolled in beneficiary schools. The midline report found that control schools had a greater increase enrollment, but the sample size was not large enough to declare statistical significance (Trembley consulting, 2019). These mixed results are consistent with the broad literature, as the results of the four studies assessing enrollment are inconsistent (Wall, 2022).

Academic Achievement

In the Midterm Evaluation, Early Grade Reading Assessment (EBRA) was used to measure literacy outcomes. This report shows that the percent of children meeting the benchmark was inconsistent. Among second graders, 14.6% more children met the benchmark in beneficiary schools. When comparing fourth grade students, both treatment and control groups saw a fall in the percentage of students meeting the benchmark with the treatment schools seeing a larger decrease. The inconsistency of the benefits to students is also observed in the literature. Indicator design and external factors may play a role in the discrepancies among data.

Senegal

Attendance

Baseline attendance data was not available for the FY 2020 evaluation, so this could not be used to assess changes in attendance (USDA dataset, 2020). The Final Evaluation of the program in 2018 supports the claim that student attendance has increased in beneficiary schools compared to the baseline study (MGD FFE Evaluation Report, 2018). Teachers in the beneficiary schools noticed that children stayed longer at school during the day because they did not have to go home to eat (MGD FFE Evaluation Report, 2018). There was a concern that the data was unreliable due to the method used to track attendance and enrollment (MGD FFE Evaluation Report, 2018). A Baseline Evaluation of a new project in 2019 revaluates this claim and confirms that attendance is high in this area (MGD FFE Evaluation Report, 2019). The report claims that attendance has no relationship to whether a school has a feeding program (MGD FFE Evaluation Report, 2019). This claim is not consistent to the broad literature, as all studies included in a systematic review of the topic found that attendance increased in beneficiary schools when compared to control schools (Wall, 2022).

Enrollment

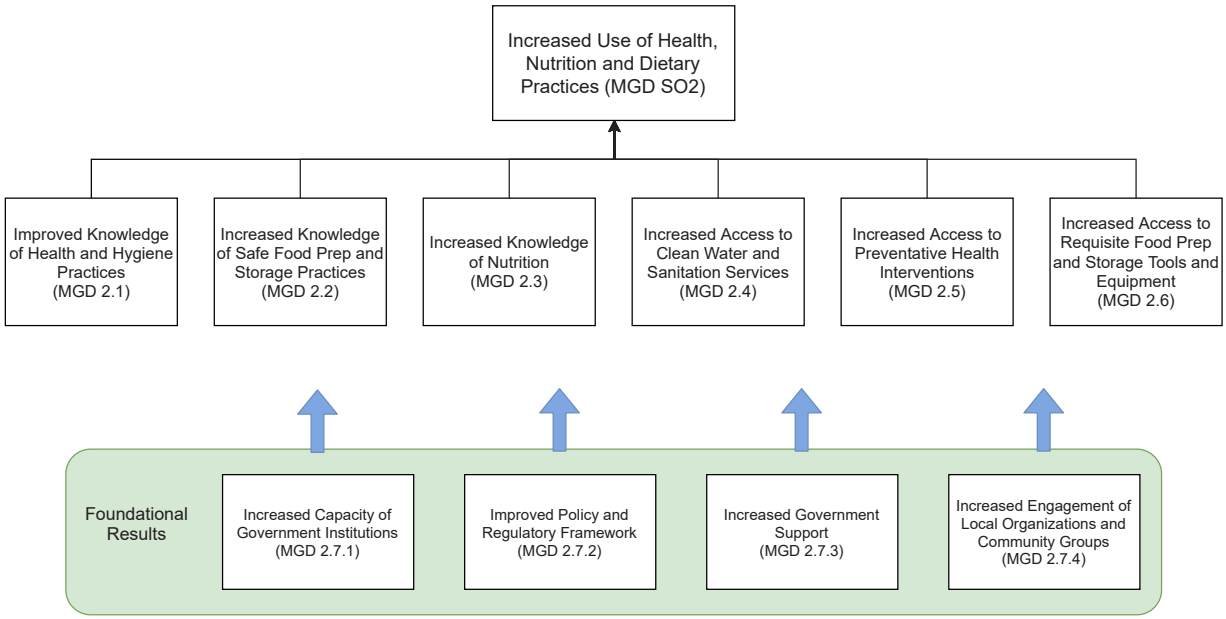
According to the FY 2020 data, enrollment in beneficiary schools increased from baseline to the first half of the year by 2,561 students. Enrollment data was not collected for the second half of the year due to school closures because of the COVID-19 pandemic, but there is still a clear increase in enrollment from the baseline. At the end line evaluation, school officials stated that the treatment program had a positive effect on enrollment, but the evaluation found limited data to support this statement (MGD FFE Evaluation Report, 2018). As seen in the broad literature, enrollment is a difficult indicator to use for assessment, as the data can be unreliable or inconclusive (Wall, 2022).

Academic Achievement

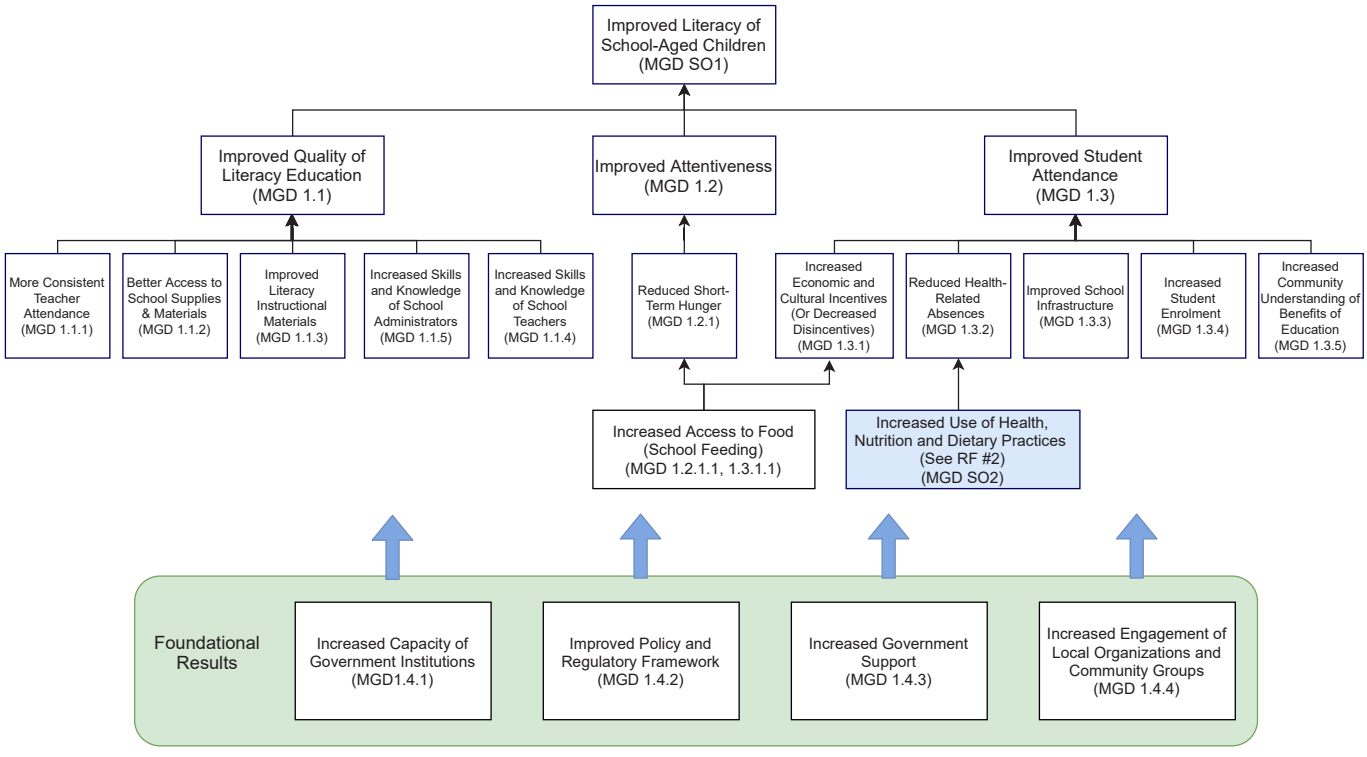
The Final Evaluation compared Annual Status of Education Report (ASER) literacy assessment scores at baseline midline, and final evaluation (MGD FFE Evaluation Report, 2018). This report shows that literacy rates improved from baseline to midline across all grade levels. The third grade (CE1) student scores increased by 1.57 levels. The fourth and fifth grade scores both increased by 1.5 levels (MGD FFE Evaluation Report, 2018). Indicators of academic achievement are the most heterogenous in the broad literature (Wall, 2022). Still, measuring improved academic outcomes is the most concrete evidence for the positive effect of school meal programs (Wall, 2022).

Appendix

McGovern Dole Results Framework #2



McGovern Dole Results Framework #1



Appendix 1.1 MGD Performance Indicators. Result for Rwanda

Table A. Rwanda-MGD: Selected Performance Indicators (Standard and Custom) for Education and Literacy Component

MGD PERFORMANCE INDICATOR - RWANDA	FY 16 2nd Half	FY 17 1st Half	FY 17 2nd Half	FY 18 1st Half	FY 18 2nd Half	FY 19 1st Half	FY 19 2nd Half	FY 20 1st Half	FY 20 2nd Half
Number of students enrolled in school receiving USDA assistance	82,360	94,572	84,876	84,992	83,590	81,250	81,250	78,410	0
Number of students regularly (80%) attending USDA supported classroom/school	77,272	89,887	81,382	81,707	79,931	79,140	76,992	n.a.	0
Percentage of students in classroom identified as attentive by their teachers **(CI)**	60	60	60	N/A	N/A	57.4	57.4	57.4	57.4
Number of school administrators and officials in target schools who demonstrate use of new techniques or tools as a result of USDA assistance	0	0	0	93	181	119	237	239	0
Number of school administrators and officials trained or certified as a result of USDA assistance	0	0	0	25	252	127	108	0	262
Number of teacher/educators/teaching assistants in target schools who demonstrate use of new techniques or tools as a result of USDA assistance	0	841	874	326	949	683	1,240	1,195	0
Number of teacher/educators/teaching assistants trained or certitied as a result of USDA assistance	0	1,039	1,105	841	1,298	946	946	250	575
Number of target schools with supplemental reading materials available to students as a result of USDA assistance **(CI)**	34	69	104	104	104	104	104	104	104
Number of textbooks and other teaching and learning materials provided as a result of USDA assistance	35,238	39,313	20,340	55,560	109,408	21,528	11,856	0	0
Number of teachers in target schools who attend and teach school at least 90% of scheduled school days per school year **(CI)**	1,344	1,322	1,354	1,354	1,423	1,409	1,435	1,558	0
Number of teachers receiving awards to promote increased teacher attendance **(CI)**	117	0	0	104	133	104	327	0	0
Number of teachers in target schools who demonstrate use of new and quality teaching techniques or tools as a result of USDA assistance **(CI)**	0	841	874	326	623	683	1,240	1,195	0
Number of students benefiting from literacy starter kits provided as a result of USDA assistance **(CI)**	23,465	15,573	50,096	50,096	45,945	43,558	43,453	41,877	0
Number of teaching and reading materials procured as a result of USDA assistance to be used in schools **(CI)**	4,080	4,633	6,300	0	2,080	21,528	0	0	0
Number of books distributed in communities to establish school and community libraries **(CI)**	28,560	0	10,080	55,560	109,408	0	11,856	0	0
Number of community-generated reading materials **(CI)**	0	290	0	32,400	59,904	0	11,856	0	0
Number of students benefiting from libraries and new reading materials as a result of USDA assistance **(CI)**	23,465	31,625	84,076	85,139	83,590	81,250	81,250	75,973	26,166
Number of parents trained on the importance of literacy	0	3,897	0	7,998	6,166	1,231	0	0	4,038
Percent of parents in target communities who can name at least three benefits of primary education	69	69	69	N/A	N/A	69.8	69.8	69.8	69.8
Number of reading clubs established as a result of USDA assistance	102	0	168	42	0	0	0	0	0
Number of student writing competitions facilitated as a result of USDA assistance	0	0	0	4	0	4	4	0	0
Number of students benefiting from the development of reading clubs	0	12,473	24,154	2.321	24,107	21,356	17,706	20,734	26,166

Source: Authors from biannual performance indicator reports provided by USDA-FAS
n.a.: Data for indicator is not available in the report. N/A: Indicators is not available in the report. **CI***: Custom Indicator*

Appendix 1.1 MGD Performance Indicators. Result for Rwanda

Table B. Rwanda-MGD: Selected Performance Indicators (Standard and Custom) for Nutrition and Health Component

MGD PERFORMANCE INDICATOR - RWANDA	FY 16 2nd Half	FY 17 1st Half	FY 17 2nd Half	FY 18 1st Half	FY 18 2nd Half	FY 19 1st Half	FY 19 2nd Half	FY 20 1st Half	FY 20 2nd Half
Number of students receiving deworming medication	72,858	87,963	0	0	83,590	0	81,250	0	78,410
Number of target schools with access to improved food preparation and storage equipment (kitchens, cook area, storerooms, stoves and kitchen utensils)	0	21	34	55	25	0	0	0	13
Number of educational facilities (i.e. school buildings, classroom, and latrines) rehabilitated/constructed as a result of USDA assistance (latrines)	0	12	7	0	7	0	2	5	1
Percent of students who miss more than 10 school days per year due to illness (female)	0	2.2	1.4	1.4	1.3	0.7	0.8	n.a.	0
Percent of students who miss more than 10 school days per year due to illness (male)	0	1.8	1.4	1.3	1.3	0.4	0.9	n.a.	0
Number of cooks and storekeepers trained on food preparation and storage practices	159	159	171	259	210	196	263	164	0
Number of schools with improved sanitary facilities	93	95	7	0	104	104	104	104	104
Number of rainwater catchment systems constructed and/or enhanced	61	36	10	0	15	0	8	0	0
Number of students benefiting from newly constructed and/or enhanced rainwater catchment systems	62,887	21,095	3,440	0	8,993	8,922	4,965	0	0
Number of educational facilities (i.e. school buildings, classrooms and latrines) rehabilitated/constructed as a result of USDA assistance (kitchens, cook areas)	21	21	34	25	0	0	0	020,734	13

Source: Authors from biannual performance indicator reports provided by USDA-FAS
n.a.: Data for indicator is not available in the report.
N/A: Indicators is not available in the report.
CI: *Custom Indicator*

Appendix 1.2 MGD Performance Indicators. Results for Sierra Leone.

Table A. Sierra Leone Performance Data for Education and Literacy Component

MGD PERFORMANCE INDICATORS	FY 16 1st Half	FY 16 2nd Half	FY 17 1st Half	FY 17 2nd Half	FY 18 1st Half	FY 18 2nd Half	FY 19A 1st Half	FY 19A 2nd Half	FY 19B 1st Half	FY 19B 2nd Half	FY 20 1st Half	FY 20 2nd Half
Percent of students who, by the end of two grades of primary schooling, demonstrate that they can read and understand the meaning of grade level text	0	8	8	36	36	59	59		0	5.58	5.58	5.58
Number of students regularly (80%) attending USDA supported classrooms/schools	0	28,206	31,380	28,745	9,443	28,501	31,315					
Average student attendance rate in USDA supported classrooms/schools									0	68.1	77	77
Number of students enrolled in schools receiving USDA assistance (total)	0	28,309	32,042	32,522	28,304	29,083	32,684		0	44,074	50,294	51,753
Number of sets of improved early grade literacy instructional materials	0	0	723	0	n.a.	0	2,171					
Number of teacher/educators/teaching assistants in target schools who demonstrate use of new and quality techniques or tools as a result of USDA assistance	0	0	701	954	975	1,008	1,292		0	0	0	0
Number of teacher/educators/teaching assistants trained or certitied as a result of USDA assistance	0	150	0	293	0	164	392		0	0	711	730

Source: Authors from biannual performance indicator reports provided by USDA-FAS
n.a.: Data for indicator is not available in the report.
N/A: Indicators is not available in the report.
CI: *Custom Indicator*

Appendix1.2 MGD Performance Indicators. Results for Sierra Leone.
Table B. Sierra Leone MGD Performance Data for School Meals, Nutrition, Health, and Wash

MGD PERFORMANCE INDICATORS	FY 16 1st Half	FY 16 2nd Half	FY 17 1st Half	FY 17 2nd Half	FY 18 1st Half	FY 18 2nd Half	FY 19A 1st Half	FY 19A 2nd Half	FY 19B 1st Half	FY 19B 2nd Half	FY 20 1st Half	FY 20 2nd Half
Number of daily school meals (breakfast, snack, lunch) provided to **school-age children** as a result of USDA assistance	0	407,432	3,133,912	32,391,655	1,916,125	1,859,122	2,340,600		0	251,405	476,024	53,332
Number of daily school meals (breakfast, snack, lunch) provided to **teachers** as a result of USDA assistance	0	1,143	90,027	61,213	67,558	62,482	79,166					
Number of individuals receiving **take-home rations** as a result of USDA assistance	n.a.	n.a.	n.a.	533	6,402	10,401	519		0	2,745	5,211	54,263
Number of school-age children receiving daily school meals (breakfast, snack, lunch) as a result of USDA assistance	0	9,448	32,042	32,522	28,304	29,083	32,684		0	29,703	50,294	2,992
Number of school-age children receiving daily school meals (breakfast, snack, lunch) as a result of USDA assistance (female)	0	4,563	15,553	15,749	13,594	13,942	15,338					
Number of school-age children receiving daily school meals (breakfast, snack, lunch) as a result of USDA assistance (male)	0	4,880	16,489	16,773	14,710	15,141	17,346					
Number of take-home rations provided (in metric tons) as a result of USDA assistance	0	641	52,404	34,150	40,570	43,541	40,718					
Quantity of take-home rations provided (in metric tons) as a result of USDA assistance									0	5.82	112.68	694.95
Number of teachers receiving daily school meals (breakfast, snack, lunch) as a result of USDA assistance	0	281	937	954	975	1,008	1,292					
Number of students receiving deworming medication(s)	0	0	26,698	0	0	28,831	32,684		0	0	0	0
Number of children under five (0-59 months) reached with nutrition-specific interventions through USDA-supported programs									0	0	0	80
Number of children under two (0-23 months) reached with community-level nutrition interventions through USDA-supported programs									0	0	0	80
Number of pregnant women reached with nutrition-specific interventions through USDA-supported programs									0	0	0	60
Number of educational facilities (i.e. school buildings, classromms, water sources, and latrines) rehabilitated/ constructed as a result of USDA assistance (latrines)	0	0	61	1	1	0	52					
Number of schools using an improved water source	0	0	0	0	0	24	40		0	161	184	0
Number of schools with improved sanitary facilities	0	0	61	1	1	0	52		0	47	143	19
Number of educational facilities, (i.e. school buildings, classrooms, improved water sources, and latrines) rehabilitated/ constructed as result of USDA assistance	0	0	0	123	14	2	97		0	0	73	0
Number of WASH clubs formed	0	30	55	30	22	22	44	0				

Source: Authors from biannual performance indicator reports provided by USDA-FAS
n.a.: Data for indicator is not available in the report.
N/A: Indicators is not available in the report.
CI: *Custom Indicator*

Appendix 1.3 MGD Performance Indicators. Results for Tanzania
Table A. Tanzania MGD Performance Data for Education and Literacy Component

MGD PERFORMANCE INDICATOR - TANZANIA	FY 17B 1st Half	FY 17B 2nd Half	FY 18B 1st Half	FY 18B 2nd Half	FY 19 1st Half	FY 19 2nd Half	FY 20 1st Half	FY 20 2nd Half
Percent of students who, by the end of two grades of primary schooling, demonstrate that they can read and understand the meaning of grade level text	0	16	0	0	0	20.1	0	0
Percent of schools in which at least 80% of teachers were present on 90% of school days (CI)	0	0	0	0	34	31.7	29	55
Number of textbooks and other teaching and learning materials provided as a result of USDA assistance	0	300	161,978	64,182	15,570	0	157,796	0
Number of teacher/educators/teaching assistants in target schools who demonstrate use of new techniques or tools as a result of USDA assistance	0	304	0	427	179	340	0	0
Number of teacher/educators/teaching assistants trained or certitied as a result of USDA assistance	0	312	486	943	0	464	0	0
Number of school administrators and officials trained or certified as a result of USDA assistance	0	1,003	0	0	0	1,890	45	273
Number of school administrators and officials in target schools who demonstrate use of new techniques or tools as a result of USDA assistance	0	0	0	0	1,877	2007	2043	0
Number of daily school meals (breakfast, snack, lunch) provided to school-age children as a result of USDA assistance	0	1,080,055	10,876,866	24,877,989	8,332,312	6,172,181	2,994,525	1,629,494
Number of school-age children receiving daily school meals (breakfast, snack, lunch) as a result of USDA assistance (total)	0	107,790	168,009	168,160	171,005	171,005	169,178	169,231
Number of students regularly (80%) attending USDA supported classrooms/schools (total)	0	112,296	107,633	106,782	137,080	123,123	142,109	134,543
Number of students enrolled in schools receiving USDA assistance (total)	0	161,393	168,009	168,160	171,005	171,005	169,178	169,231
Total quantity of commodities (tons) provided for school meals as a result of USDA assistance (CI)	0	0	0	0	467	0	160	
Number of teachers receiving non-monetary incentives (certificates and awards) (CI)	0	0	0	0	0	0	17	462

Source: Authors from biannual performance indicator reports provided by USDA-FAS
n.a.: Data for indicator is not available in the report.
N/A: Indicators is not available in the report.
CI: *Custom Indicator*

Appendix 1.3 MGD Performance Indicators. Results for Tanzania
Table B. Tanzania MGD Performance Data for Nutrition, Health and Wash

MGD PERFORMANCE INDICATOR - TANZANIA	FY 17B 1st Half	FY 17B 2nd Half	FY 18B 1st Half	FY 18B 2nd Half	FY 19 1st Half	FY 19 2nd Half	FY 20 1st Half	FY 20 2nd Half
Number of individuals trained in child health and nutrition as a result of USDA assistance (total)	0	569	238	0	230	284	227	45
Number of people trained in child health and nutrition as a result of USDA assistance (total)	0	0	0	0	34	31.7	29	55
Number of schools using an improved water source	0	85	119	23	149	165	165	167
Number of schools with improved sanitary facilities	0	114	224	22	183	203	205	205

Source: Authors from biannual performance indicator reports provided by USDA-FAS
n.a.: Data for indicator is not available in the report.
N/A: Indicators is not available in the report.
CI: *Custom Indicator*

Appendix 1.3 MGD Performance Indicators. Results for Tanzania
Table C. Tanzania MGD Performance Data for Community Groups and School Gardens

MGD PERFORMANCE INDICATOR - TANZANIA	FY 17B 1st Half	FY 17B 2nd Half	FY 18B 1st Half	FY 18B 2nd Half	FY 19 1st Half	FY 19 2nd Half	FY 20 1st Half	FY 20 2nd Half
Number of parents, guardians, and other community members participating in savings and lending group (CI)	n.a.	n.a.	n.a.	n.a.	2687	10,464	9,542	11,163
Percent of parents and/or guardians receiving a loan through their savings and lending group (CI)	0	0	0	0	9,936*	98	98	95
Total quantity of commodities (tons) grown in school gardens and provided for school meals (CI)	0	0	0	0	23	0	49	67

Source: Authors from biannual performance indicator reports provided by USDA-FAS
n.a.: Data for indicator is not available in the report.
N/A: Indicators is not available in the report.
CI: *Custom Indicator*
**Incorrectly reported value*

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