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Management of Moderate Wasting Using Local Foods

Costing Study for Tom Brown and Porridge Mum in North East Nigeria

OCTOBER 2023

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Acronyms

AAH	Action Against Hunger
CNM	community nutrition mobilizer
CMAM	community-based management of acute malnutrition
CRS	Catholic Relief Services
FA	field assistant
FSL	food security and livelihoods
JDPC	Justice, Development, and Peace Commission
LGA	local government area
LM	lead mother
MAM	moderate acute malnutrition
MEAL	monitoring, evaluation, accountability, and learning
MOH	Ministry of Health
MUAC	mid-upper arm circumference
NEYIF	North East Youth Initiative Forum
NFI	non-food item
PLW	pregnant and lactating women
PUI	*Premiere Urgence Internationale*
RUSF	ready-to-use supplementary food
SCI	Save the Children International
SFF	specially formulated food
TSFP	targeted supplementary feeding program
USAID	U.S. Agency for International Development
U.S.$	United States dollar
WFP	World Food Programme

Executive Summary

Background

Management of moderate wasting (moderate acute malnutrition) is an important component of country-level strategies to address wasting, given the high numbers of moderately wasted children and their susceptibility to illness and death. For more than a decade, community-based management of acute malnutrition (CMAM) approaches have reduced morbidity and mortality using targeted supplementary feeding programs (TSFP) that treat moderately wasted children using specially formulated food (SFF), such as ready-to-use supplementary foods (RUSF) and fortified flour blends. While these ready-to-use products provide the micro- and macro-nutrients needed for rehabilitation from moderate wasting, many countries experience challenges with the supply chain for SFFs resulting in a lack of availability and limited accessibility that inhibits program effectiveness. SFFs are not typically available on the open market, so if caregivers cannot obtain them through routine service delivery points like TSFP, they often have few alternatives.

In light of these supply chain challenges, implementing partners in some countries, including Nigeria, have developed programmatic approaches that use locally available foods to manage moderate wasting. However, there is little evidence to inform their potential scale-up, including their replicability in other contexts. Limited evidence is available to date on managing moderate wasting using local foods and the cost of managing and treating wasting, in general (USAID Advancing Nutrition 2023). Existing cost data for managing wasting is almost exclusively limited to studies that look at the treatment of wasting through traditional CMAM programs.

Nigeria's use of alternative approaches using locally available foods to manage moderate wasting offers an opportunity to conduct a costing study to inform future programming and possible scale-up of these approaches, where relevant. Two approaches to moderate wasting management—Tom Brown and Porridge Mum—are the focus of this costing study. We examined the cost of Tom Brown as implemented by three implementing partners: Catholic Relief Services (CRS), *Premiere Urgence Internationale* (PUI), and Save the Children International (SCI); and the cost of Porridge Mum as implemented by Action Against Hunger (AAH).

Objective and Methodology

This costing study documents the costs for the Tom Brown and Porridge Mum approaches as implemented by the selected implementing partners in North East Nigeria. The study estimates the cost efficiency of each approach by calculating the cost per child (Tom Brown) and cost per beneficiary (Porridge Mum) enrolled. The costing study includes institutional costs (e.g., costs paid by the implementing partner) as well as select societal costs (e.g., opportunity costs for program beneficiaries and volunteer roles) that were identified as being resource intensive through the review of program documents.

Summary of Results

Table 1 provides an overview of our costing results for each implementing partner.

Table 1. Overview of Results by Implementing Partner

Program	CRS Tom Brown	PUI Tom Brown	SCI Tom Brown	AAH Porridge Mum
Institutional cost	$2,240,750.12 (94%)	$282,793.70 (95%)	$1,578,164.92 (95%)	$770,678.31 (97%)

Program	CRS Tom Brown	PUI Tom Brown	SCI Tom Brown	AAH Porridge Mum
Societal costs	$134,979.49 (6%)	$14,716.00 (5%)	$88,558.40 (5%)	$19,964.95 (3%)
Total cost	$2,375,729.61	$297,509.70	$1,666,723.32	$790,643.26
Time period	23 months *June 2021–April 2023*	30 months *January 2021–June 2023*	23 months *June 2021–April 2023*	7 months *November 2022–May 2023*
Monthly cost	$103,292.59	$9,916.99	$72,466.23	$112,949.04
Total no. children/ beneficiaries enrolled	12,890	1,920	3,376	1,872
Total cost per child/beneficiary enrolled	$184.31	$154.95	$493.70	$422.35
Monthly supplementation cost per beneficiary	$8.01	$5.17	$21.47	$60.34

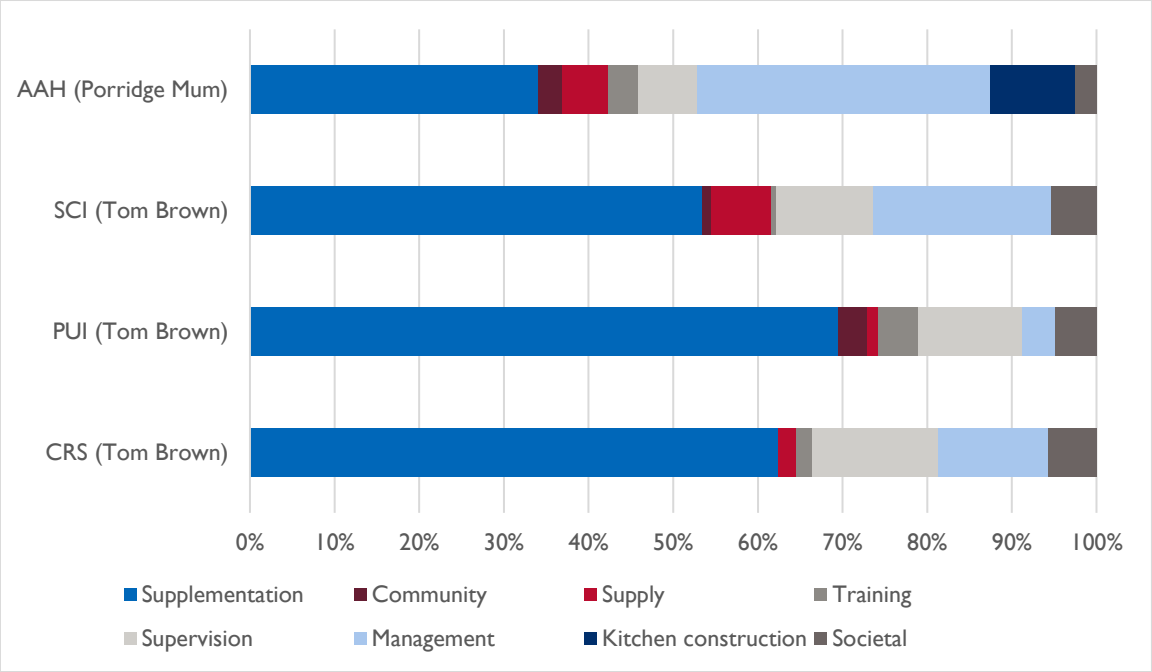
Table 2 and figure 1 summarize the total institutional and societal costs for each implementing partner by cost category in value and percentage.

Table 2. Total Institutional and Societal Program Expenditures by Cost Category (U.S.$)

Cost Category	CRS	PUI	SCI	AAH
Institutional Costs (implementing partners)				
Supplementation	1,481,004.86	206,718.50	889,744.62	269,852.96
Community	83.61	10,360.42	18,533.62	21,544.77
Supply	52,947.93	3,915.42	117,396.61	43,232.46
Training	42,984.66	13,848.35	10,797.72	27,770.43
Supervision	355,117.54	36,625.84	190,847.23	55,073.41
Management	308,611.52	11,324.70	350,845.13	274,236.78
Kitchen construction				78,967.50

Cost Category	CRS	PUI	SCI	AAH
Societal Costs				
Societal	134,979.49	14,716.00	88,558.40	19,964.95
TOTAL	**2,375,729.61**	**297,509.70**	**1,666,723.32**	**790,643.26**

Figure 1. Total Institutional and Societal Program Expenditures by Cost Category (%)



Interpretation of Results

Differences in the cost per child/beneficiary are clear across the Tom Brown and Porridge Mum approaches. However, a lower unit cost (cost per child or beneficiary) does not automatically mean a more cost efficient or better value-for-money program model. Our analysis shows these differences in unit costs are based on missing operating costs for one of the programs, the time period of the analysis and associated implementation period, and certain program features.

Missing Operating Costs

The PUI cost data includes non-direct Tom Brown staff resources, including finance, logistics; and monitoring, evaluation, accountability, and learning (MEAL) staff. However, other operating costs attributable to the program, including office costs in Borno and at the national level, were unavailable and were not assessed. This resulted in a lower cost per child enrolled when compared to the other programs, despite the lower number of children enrolled (1,920 children enrolled) and likely underestimates the actual total cost of the program.

Period of Implementation and Coverage

According to the results, the Porridge Mum approach seems to be more resource intensive than Tom Brown and it results in a higher cost per beneficiary enrolled. However, given the shorter overall implementation time frame—only seven months compared to several years for the Tom Brown

partners— there were likely some investments in capital costs and staff capacities that did not have a chance to average out (or depreciate) during this shorter implementation period. Given a longer period of implementation at scale, the cost per beneficiary enrolled may be less.

One of the main contributing factors for the difference in the cost per child enrolled in the Tom Brown programs is the coverage of the programs (i.e., the more children enrolled, the lower the cost per child enrolled). As the developer of the Tom Brown approach, CRS has reached the highest number of beneficiaries throughout the period captured in this analysis (12,890 children enrolled). However, all things equal, they still have one of the lowest costs per child enrolled.

Program Features

We identified several program features that influenced overall program cost to varying degrees. These included the cost of non-food items—cooking equipment, mats, and mid-upper arm circumference (MUAC) tapes—transportation and storage models for programs providing in-kind food rations, costs associated with cash and voucher transfers, and volunteer cadres stipends.

Societal Costs

From our analysis, we can see that opportunity (societal) costs of the interventions are substantial. The results highlight that it is critical to include and consider the opportunity costs of volunteer community-based workers and food vendors in the costs, which are essential to the scalability of the interventions. Without this inclusion, partners risk underestimating the costs of their programs, the implications of community-level service delivery, and household participation.

While those partners using the cash/voucher model, which rely on Lead Mothers (LMs) or other beneficiary mothers to purchase the food ingredients for the groups, have identified benefits and efficiencies in the model over consolidated program procurement and storage of ingredients, the model places a heavier opportunity cost on the community (food vendors, community workers, and beneficiaries), which should be considered. AAH's Porridge Mum approach has the highest opportunity cost (U.S.$297.98) per group.

Comparing Costs of Local Food-Based Approaches to TSFP

Table 3 is an overview of the cost per child/beneficiary of the Tom Brown and Porridge Mum approaches alongside other costing studies for TSFP. It is important to interpret these figures with caution, as the implementation contexts and costing methodologies used are different. Although we present it alongside programs designed to specifically address moderate wasting management, it is important to remember that Porridge Mum is not designed as a program to manage moderate wasting and that it also provides services to pregnant and lactating women (PLW) and has a much broader set of intended outcomes, therefore potentially justifying its higher per beneficiary cost. All costs have been adjusted to 2023 U.S. dollars.

Table 3. Summary of Unit Costs across Approaches

	TSFP Sierra Leone	TSFP Mali	TSFP Locally Produced Biscuits Indonesia	Tom Brown Nigeria	Porridge Mum Nigeria
Unit cost (adjusted to 2023 dollars)	$101.04–$105.30	$126.41–$128.86	$446.79 - $560.3	$154.95–$493.70	$422.35

	TSFP Sierra Leone	TSFP Mali	TSFP Locally Produced Biscuits Indonesia	Tom Brown Nigeria	Porridge Mum Nigeria
Inclusion of societal costs	Limited	No	Yes	Yes	Yes
Summary of included costs	Food product, clinic activities, admin and management costs; including personnel, capital costs, logistical support, and limited societal costs.	Supplementary food, program personnel, medical supplies and materials, infrastructure, and logistical support.	Food and non-food items (NFIs), personnel, institutional costs, limited logistical support, and societal costs.	Institutional and societal costs as outlined in the methods section.	Institutional and societal costs as outlined in the methods section.

Sources: (Griswold et al. 2021; Isanaka et al. 2019; Purwestri et al. 2012)

Conclusions and Key Considerations for Scale-Up

In areas where coverage of TSFP for supplementation of moderate wasting is limited, the Tom Brown and Porridge Mum approaches may be considered as alternative approaches to manage the moderate wasting caseload. This cost-efficiency analysis has highlighted several cost-related factors to consider, with technical considerations, when determining which approach, if any, is appropriate for the context.

Implementation Context

These results are specific to the implementation context in North East Nigeria, which is an ongoing emergency and food insecure context. This context predicates certain implementation decisions that, in turn, have cost implications. For example, all programs provide food items to program participants, either in-kind or facilitate their purchase using cash or vouchers. When looking at an individual Tom Brown or Porridge Mum group, these costs account for between 21 and 42 percent of per group costs for Tom Brown and 60 percent of per group costs for Porridge Mum. If a context were more food secure and a different model was used (e.g., mothers were taught to produce the flour/recipes but could procure the food inputs with their own resources) the cost implications would differ.

Potential Coverage and Scale

The recently released *WHO Guideline on the Prevention and Management of Wasting and Nutritional Oedema (Acute Malnutrition) in Infants and Children Under 5 Years* provides updated guidance on the management of moderate wasting in children under five. Importantly, it emphasizes the use of nutrient-dense foods, inclusive of locally available foods that are typically consumed by households, to support the recovery of moderately wasted children (WHO 2023). This means there is a great potential to scale-up programs—such as Tom Brown and Porridge Mum—after countries, including Nigeria, begin to adapt their programs to manage and treat wasting to this new guidance.

As illustrated by our analysis of Porridge Mum, the shorter implementation period, which did not allow for a similar depreciation of initial program start-up investments (e.g., kitchen construction and staff capacity), has contributed to its higher per beneficiary cost in this analysis, whereas CRS's longer implementation period and higher level of coverage contributed to a lower cost per child. The same is true of PUI's lower Tom Brown coverage rate compared to CRS's and SCI's coverage, resulting in a higher unit cost.

When considering scaling up or introducing these approaches to a new area (known as replication), it is important to consider factors that may impact potential coverage, such as moderate wasting prevalence and population concentration. In some ways, Tom Brown and Porridge Mum have higher up-front investments than a TSFP because the approach needs to be established in each community, but a TSFP is linked to an already-established facility that covers several communities. However, as noted earlier, there are also tradeoffs in terms of opportunity costs to the caregivers in terms of time required to produce the flour/recipes versus traveling to the clinic to seek care. It is also important to consider the potentially higher opportunity cost of traveling to a health facility only to find that treatment is not available due to low coverage or a break in service delivery due to supply chain issues. A community-based approach may be more appropriate for areas where traveling to a facility poses security concerns. However, a population that is prone to displacement may not be well suited to an approach anchored in a community. Questions around potential coverage and scale must be considered carefully alongside these kinds of contextual considerations.

Societal Costs

Although as a proportion of total program costs societal costs are quite small, ranging from 3 to 6 percent, these costs as opportunity costs to an individual may be quite significant. When compared to the minimum wage in Nigeria (30,000 Naira; U.S.$39.00), the beneficiary mothers are conducting activities that require a level of effort that is valued at more than 10 percent of the monthly minimum wage in all programs except PUI, which is only slightly lower (2,247 Naira; U.S.$2.92). Our analysis also suggests that there are higher opportunity costs when cash/vouchers are used. One factor driving this higher cost is the additional time that volunteers (e.g., LMs, assistant beneficiary mothers, secretaries) must spend to purchase food from the vendors. It is also important to note that our analysis did not include additional opportunity costs to beneficiary mothers in Porridge Mum groups to purchase foods using their individual vouchers or to prepare new or additional meals during the week.

In-Kind Food Distributions versus Cash and Vouchers

Our analysis found that the use of cash and/or vouchers is a significant driver of societal costs. It also represents a potential significant institutional cost if an existing food security and livelihoods (FSL) program is not already in place. Even with an existing FSL program in place, the reliance on the existing FSL structure is not without cost. However, the cash and/or voucher model of Tom Brown and Porridge Mum offer additional opportunities for sustainability. Because the grains are sourced from local food vendors, vendors within the community are sensitized through nutritional messaging from the program and are exposed to what grains and food ingredients offer high nutritional value. This increases the likelihood that the vendors in the community will continue to carry these ingredients even after the program ends so beneficiaries can continue to replicate the recipes. This has already been seen in the community served by CRS.

Areas for Additional Research and Learning

Evidence on the use of local foods for the management of moderate wasting is limited, for both their general programmatic effectiveness as well as their cost effectiveness. Of the 10 peer reviewed studies we identified that were related to using local foods to manage moderate wasting, five reported on recovery rates and all met Sphere standards for recovery. Some studies also compared local food-based recipes and rations to other commercially produced products like CSB+, and were found to be non-

inferior (USAID Advancing Nutrition 2023). Having a more robust evidence base for effectiveness is important as it enables costing studies to also look at cost effectiveness, rather than only cost efficiency, as was done for this particular study in Nigeria. As nutrition stakeholders begin to put into practice the updated WHO guidance, especially related to the management of lower-risk children with moderate wasting, additional costing studies that include primary data collection on approach effectiveness should be conducted to help further inform decisions on which approaches (e.g., Tom Brown, Porridge Mum, or TSFP) is the most appropriate, based on tradeoffs between contextual appropriateness, effectiveness, and cost at scale. Additionally, research should ensure the use of consistent methods, where possible, and the use of standard definitions of outputs and outcomes indicators, as well as cost categories to increase uptake and comparability of results across the sector. Guidelines and tools for such research have been reviewed, recommended, and endorsed in 2020 and 2023 (Chui et al. 2020; Chui and Trenouth 2023).

Background

Management of moderate wasting (moderate acute malnutrition) is an important component of country-level strategies to address wasting, given the high numbers of moderately wasted children and their susceptibility to illness and death. For more than a decade, community-based management of acute malnutrition (CMAM) approaches have reduced morbidity and mortality using targeted supplementary feeding programs (TSFP) that treat moderately wasted children using specially formulated food (SFF), such as ready-to-use supplementary foods (RUSF) and fortified flour blends. While these ready-to-use products provide the micro- and macro-nutrients needed for rehabilitation from moderate wasting, many countries experience challenges with the supply chain for SFFs resulting in a lack of availability and limited accessibility that inhibits program effectiveness. SFFs are not typically available on the open market, so if caregivers cannot obtain them through routine service delivery points like TSFP, they often have few alternatives.

Because of these supply chain challenges, implementing partners in some countries, including Nigeria, have developed programmatic approaches that use locally available foods to manage moderate wasting. However, there is little evidence to inform their potential scale-up, including their replicability in other contexts.

An important aspect of scalability and replicability is the cost of these program approaches. Collecting and analyzing cost data is an important aspect of the documentation of new approaches and helps implementers better understand program options and enables them to weigh the selection of different approaches when planning and budgeting. Limited evidence is available to date on managing moderate wasting using local foods and the cost of managing and treating wasting in general (USAID Advancing Nutrition 2023).

Box 1: Types of Economic Evaluation Approaches

Cost analysis (costing): Systematically assessing the costs of developing and/or implementing an intervention, with or without additional data on the outputs or outcomes of the intervention.

Cost efficiency analysis: An analysis of the costs of producing outputs of an intervention. The results are frequently expressed as a unit cost for producing a particular output.

Cost effectiveness analysis: An analysis of the costs of producing outcomes of an intervention, or the amount of cost required to achieve a given effect or impact.

Existing cost data for managing wasting is almost exclusively limited to studies that look at the treatment of wasting through traditional CMAM programs. There are limitations with the existing data, including the incomparability of cost data across country contexts, implementers, and policy contexts, as well as inconsistencies in methodologies used (see box 1 for costing methodology definitions). For example, existing cost-efficiency data from Sierra Leone found the cost per child enrolled in TSFP to be U.S.$83.00–86.50, depending on the supplement used (e.g., RUSF or various types of fortified flour blends) (2018 U.S.$ rate) (Griswold et al. 2021). A cost-effectiveness study in Mali found the cost per child treated to range from U.S.$98.01 for RUSF to U.S.$99.91 for distributing a locally milled flour mixture (2015 U.S.$ rate) (Isanaka et al. 2019). Finally, a cost-effectiveness study from Nias Island, Indonesia, reported a range of costs for daily- and weekly-distribution and supervision of locally produced ready-to-use biscuits for the rehabilitation of moderately and mildly wasted children, from U.S.$164.50–U.S.$581.50 (2007 U.S.$ rate) (Purwestri et al. 2012). It is expected that some costs will differ across context, implementers, and program modalities if the analysis methodologies are consistent, so a more robust evidence base per country context is required for comparability.

While these estimates are important contributions to the limited evidence on the costs of managing moderate wasting, they only represent program approaches that use SFFs distributed through local health centers, and not the costs of interventions that use locally available foods that are prepared and/or distributed at the community level. Nigeria's use of alternative approaches using locally available foods for managing moderate wasting offers an opportunity to conduct a costing study to inform future programming and possible scale-up these approaches, where relevant. Two approaches to moderate wasting management, Tom Brown and Porridge Mum, are the focus of this costing study. We examined the cost of Tom Brown as implemented by three implementing partners: Catholic Relief Services (CRS), *Premiere Urgence Internationale* (PUI), and Save the Children International (SCI); and the cost of Porridge Mum as implemented by Action Against Hunger (AAH).

CRS developed the Tom Brown approach where caregivers, typically women, of moderately wasted children are assigned to groups whose focus is to provide supplementary feeding for these children until they are cured. These groups of women produce a flour, called Tom Brown, made from locally sourced ingredients, including millet, maize, or sorghum, soya, and groundnuts. The women then take the flour home and prepare it as a porridge for children aged 6–59 months with moderate wasting—mid-upper arm circumference (MUAC) ≥115 mm to <125 mm—for a minimum period of eight weeks. The Porridge Mum approach, developed by AAH, is to be implemented with other food and cash distribution programming. It is not designed specifically as an approach to manage moderate wasting, but rather provides additional nutritional support to pregnant and lactating women or other caregivers with children under the age of two. Both the Porridge Mum group and its members receive electronic cash and/or voucher transfers to purchase foods to prepare nutritious recipes. Women gather at a communal cooking site where they learn to make the recipes during cooking demonstrations and receive monthly health and nutrition education. Table 4 summarizes the Tom Brown and Porridge Mum programs examined through this costing study. A more detailed description of each approach is provided in the program descriptions in the findings section below. For a full description of each approach, please see the report, *Management of Moderate Wasting Using Local Foods: Documentation of Approaches in Nigeria, Senegal, and Uganda* (USAID Advancing Nutrition 2023).

Table 4. Program Features

	Tom Brown			Porridge Mum
	CRS	PUI	SCI	AAH
Period analyzed	June 2021–April 2023	January 2021–June 2023	June 2021–April 2023	November 2022–May 2023
Program structure	CRS and two local partners	PUI and no local partners	SCI and one local partner	AAH and no local partners
Program setting	Emergency/rural and peri-urban	Emergency/rural	Emergency/rural	Emergency/rural

	Tom Brown			Porridge Mum
	CRS	PUI	SCI	AAH
Storage model	Procured in batches, stored in satellite offices, delivered to Lead Mother's (LM) houses weekly. *Peri-urban model has moved to cash vouchers.*	Procured in batches and stored in a central World Food Programme (WFP) storage facility in Monguno (at no cost to the program) and delivered to LM houses weekly.	Procured and stored centrally at the SCI Maiduguri office/warehouse and delivered to LM houses weekly.	Procured by secretaries and treasurers on a weekly basis (no storage)
Group facilitator (volunteer role)	LM	LM	LM	Secretary and Treasurer
Children/ beneficiaries enrolled	12,890	1,920	3,376	1,872
Active groups	1,081	160	315	67
Cycle duration	8 weeks	8 weeks	10 weeks	7 months

Malnutrition Situation in Nigeria

In Nigeria, 6.8 percent of children aged 6–59 months are wasted (NPC and ICF 2019). North East Nigeria is one of the most affected regions of the country, with an estimated 2 million wasted children living in the three most affected states of Adamawa, Borno, and Yobe, of which 1.3 million were moderately wasted (IPC 2022). Additionally, it was estimated that over 152,000 pregnant and lactating women (PLW) were acutely malnourished and in need of nutrition interventions during 2022 (IPC 2022). In Borno state, the geographic focus of this study, the most recent estimates of wasting from the Round 12 of the North East Nigeria Nutrition & Food Security Surveillance survey, inclusive of cases identified using MUAC, weight-for-height, and edema, show a wasting prevalence of 14.3 percent in Borno, with a prevalence as high as 18.1 percent in some areas (Nigeria National Bureau of Statistics 2022). Despite the significant need, treatment coverage for moderate wasting is inadequate. According to a 2019 analysis (Nutrition in Emergency Sector Working Group 2019), about 70 percent of children suffering from moderate wasting in Borno State were not receiving treatment.

Objectives

This costing study documents the costs for the Tom Brown and Porridge Mum approaches as implemented by the selected implementing partners in North East Nigeria. The study estimates the cost efficiency of each approach by calculating the cost per child (Tom Brown) and cost per beneficiary (Porridge Mum) enrolled. The costing study includes institutional costs (e.g., costs paid by the implementing partner) as well as select societal costs (e.g., opportunity costs for program beneficiaries and volunteer roles) that were identified as being resource intensive through the review of program documents. Having data on the costs of these approaches will assist local implementers and stakeholders with program planning and provide valuable information to assess the scalability and replicability of these approaches in Nigeria. Finally, this costing study aims to contribute to the global evidence base on the cost of moderate wasting management, particularly for approaches that use locally available foods by documenting data on program components, cost drivers, feasibility, and affordability.

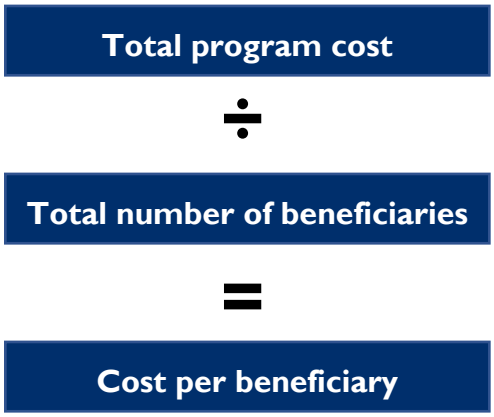
Methodology

Cost-Efficiency Analysis

Method Selection

Given the limited data on costs for locally available food-based approaches for the management of moderate wasting, this analysis focuses on estimating cost efficiency in terms of unit cost. Unit cost is estimated as the cost per child for Tom Brown programs and cost per beneficiary (children and PLW) for the Porridge Mum program. We calculated different unit costs for the two approaches because they use different enrollment criteria. Tom Brown enrolls children who are moderately wasted and they are the sole beneficiaries of the program. Porridge Mum, however, does not enroll beneficiaries based on nutritional status but instead enrolls PLW based on their enrollment in other food security and livelihoods (FSL) and other vulnerability criteria. Children of selected women that are under the age of two, regardless of their nutrition status, are also included. Both PLW and children benefit from the program activities. Cost-efficiency analysis gives actionable information for program decision-making and provides information to stakeholders on resources required and whether the approaches might be replicable in their settings. Cost estimates on the cost per child (Tom Brown) and cost per beneficiary (Porridge Mum) enrolled enables implementers to plan and budget based on expected enrollment numbers, which is particularly important when planning for potential scale up. See figure 2 for a summary of how the cost per child/beneficiary is calculated.

Figure 2. Approach to Estimating Unit Cost for Cost-efficiency Analysis



There were several reasons that cost-efficiency analysis was chosen over cost-effectiveness analysis, which estimates costs based on the number of beneficiaries recovered. First, investment and program planning decisions are based on the number of children enrolled (cost efficiency), not the number of children recovered (cost effectiveness). Second, the quality of the program outcome data, which is required for the cost-effectiveness analysis, could not be verified for these particular approaches. The design of this costing exercise did not include primary data collection on program outcomes. Instead it relied on existing outcome data, as reported by the programs. An early review of admissions and recovery data shows that recovery rates are 96–99 percent, which are not only difficult to externally verify as part of the costing study but are very high compared to other similar programs in Somalia, Kenya, Mali, and Sierra Leone, which have recovery rates ranging between 54–63 percent. With recovery rates between 96–99 percent, if assumed to be accurate, cost-efficiency estimates of cost per child enrolled would be nearly the same as cost-effectiveness estimates of cost per child recovered. In other words, if 96–99 percent of children enrolled are also recovering, then the calculation of cost efficiency and cost effectiveness are nearly the same calculations. Last, recovery is not the most appropriate outcome for all programs; for example, Porridge Mum focuses beyond management of moderate wasting and includes prevention and benefits for both mothers and non-wasted children as well. As noted above, enrollment in Porridge Mum is not based on nutritional status; therefore, cost-effectiveness with the desired outcome being a cured beneficiary would be inappropriate.

Given the differences in program structure and delivery, we have not made direct comparisons between the cost efficiency of the Tom Brown and Porridge Mum approaches. However, we noted differences in

the cost per child enrolled across Tom Brown programs, because we analyzed cost data from three different implementing partners that used slightly different program designs and delivery structures. This allows us to see how the differences in the Tom Brown implementation approach affects the cost per child enrolled. These key differences are further described in the "Results" section. Each program implementing partner collected program monitoring data on the number of beneficiary mothers included in the groups, but only CRS and SCI directly tracked the number of moderately wasted children enrolled. PUI and AAH tracked the number of mothers and PLW but not the precise number of children enrolled. Therefore, we assumed a 1:1 ratio of mothers/PLW to child for the cost-efficiency estimation.

Costs Included in the Analysis

Cost data has been aligned to cover the same time period as enrollment data to estimate the cost-efficiency of Tom Brown and Porridge Mum programs. We also documented contextual considerations, where specific cost data is available or can be calculated that represent local resources or infrastructure needed to implement these approaches. When calculating unit costs (cost per child/beneficiary), it is important to remember that a lower unit cost may not necessarily imply that an intervention is delivered with the same quality as a higher unit cost. As such, we included additional contextual data, when available, to understand the role of quality as it relates to cost implications.

While our costing approach focused primarily on institutional costs, we supplemented these costs with societal costs that were indicated as being resource intensive in program documentation (see additional details in the section on Targeted Societal Cost Estimates). We conducted time allocation interviews with partner and support staff to allocate staff resources and other shared costs when these costs were not directly associated with the delivery of either the Tom Brown or Porridge Mum approach. For Porridge Mum and the peri-urban component of CRS's Tom Brown approach—which are considered multi-sectoral due to inclusion of a voucher/cash transfer component—we also included questions in the time allocation interviews to account for the relative proportion of time staff spent supporting the nutrition and FSL components of the program. Where program staff were unable to provide specific proportions of individual staff time, estimates were provided for the entire shared costs relative to the nutrition- and FSL-specific technical components.

Because the use of cash/vouchers also depends on having an existing FSL program in place, we also captured the cost implications of the reliance on those existing structures and the further implications that has for scale-up. We also aimed to isolate the cost of any voucher/cash transfer component of the programs because scale-up may be planned in non-emergency settings where these components may not be relevant.

Institutional Cost Estimates

We aimed to follow best practice recommendations for nutrition program costing (Chui et al. 2020; Chui and Trenouth 2023), by thoroughly documenting costs and being transparent about what costs were included in our analysis. Data on program implementation were collected from the implementing partners and analyzed using a combination of step-down cost accounting and activity-based costing. This approach included reviewing outputs from the accounting databases of each partner—aligned to cover the same time period as enrollment data—to develop estimates of total program costs using actual program costs rather than budgeted costs. The step-down cost accounting method, or sequential method, is used to allocate the cost of support staff and their departments (e.g., management, accounting) and technical departments (e.g., FSL staff) to the Tom Brown and Porridge Mum programs in cases when these costs were not directly charged to the program but were contributing to their implementation. The cost allocation under the step-down method is a sequential process. Time allocation estimates from implementation and support staff are used to allocate relevant costs. Activity-

based costing refers to the allocation of costs to different activities according to their actual use or on account of some basis for allocation, (i.e., cost driver rate, time allocation).

All relevant institutional inputs required for the program to operate have been included, such as—

- **Program staff time** resources were collected for staff at all levels (i.e., both implementing/technical and support staff). Implementing staff include staff from both nutrition and FSL teams because the Porridge Mum and Tom Brown approaches are, in some cases, multi-sectoral. We identified the categories of staff that are not dedicated to the program full-time. During staff allocation interviews, staff were probed about the time they spend on activities related to the implementation of Tom Brown or Porridge Mum programs versus other programs or activities. This information assists in allocating staff and support costs and apportioning other non-program-specific support costs—such as monitoring, evaluation, accountability, and learning (MEAL) and logistics—to the program.
- **Government staff time**, where included in the program design, is also included through a similar method as above in program staff time). This was the case when government staff were involved in joint supportive supervision and were compensated for this time through institutional costs (e.g., paid directly by the implementing partner).
- **Local food costs** (see section on Fieldwork and Data Management for further information).
- **Storage and transportation**, including the operating costs of support/program vehicles.
- **Vouchers and other FSL-related costs,** where included in the program design.
- **Office running costs** for national and field-level offices.
- **Program supplies** and non-food items (NFIs) such as cooking equipment, MUAC tapes, and floor mats.
- **Stipends** paid to community-based volunteers (community nutrition mobilizers [CNMs], lead mothers [LMs], field assistants [FAs], and secretaries/treasurers).
- **Other direct costs** not included above.
- **Indirect costs,** including overhead attributable to the programs.

After an initial assessment of accounting data across the four implementing partners, cost data was grouped into the following cost categories:

- **Supplementation** costs include direct program implementation costs, such as stipends paid to community-based volunteers, food ingredients, NFIs, costs of referrals and case findings, and cost of vouchers and associated fees. This also includes personnel costs specific to treatment, such as field assistants.
- **Community** outreach costs, including printed materials, allowances, and incentives related to community outreach, specific travel costs, and personnel costs specific to community outreach.
- **Supply** costs include storage and transportation of the food ingredients and NFIs.
- **Training** costs attributable to the Tom Brown and Porridge Mum programs, including per diem for trainers, transportation reimbursement for participants and trainers, training materials, room hire, materials, etc.

- **Supervision** costs, which include personnel costs, such as nutrition officers and technical and program staff providing supervision to the Tom Brown and Porridge Mum programs (not program management costs). Supervision costs also include institutional costs of joint supervision conducted with the government staff, where appropriate.
- **Management** costs include broader program management, MEAL, and shared indirect and operating costs (including office rent).
- **Kitchen construction** costs include only those costs to construct the kitchens for the Porridge Mum program and the direct cooking demonstration setup costs.
- **Societal** costs include the opportunity costs of beneficiary group members and community-based volunteer labor (CNMs, LMs, FAs, secretaries/treasurers, and government staff where appropriate). Societal costs also include the opportunity cost of the donated storage space to PUI's Tom Brown program.

Our data collection approach used existing accounting data and information on the resources consumed during the development and implementation of the programs. This data was collected retrospectively. Additionally, because the Tom Brown and Porridge Mum approaches are embedded within existing nutrition and FSL structures, many capital cost investments (e.g., buildings and vehicles) have not been allocated by the partners as Tom Brown or Porridge Mum-specific investments and instead apportion only daily transport hire or use costs to these programs.

Targeted Societal Cost Estimates

Considering the limited time frame for this analysis, it was not possible to undertake a full societal perspective for the costing study. However, there are some elements of the broader societal costs that we identified as useful to capture and assess due to being described as "time-intensive" in program documents and because they influence the ability to scale-up the programs.

The locally available food-based approaches to manage moderate wasting present a different set of time allocation requirements for participating households compared to a facility-based TSFP approach. Facility-based approaches typically require a high burden of travel time compared to activities implemented closer to the homes of the beneficiaries. (Puett and Guerrero 2015). However, available documents, including program evaluations, indicated that the Tom Brown and Porridge Mum approaches were still time-intensive for beneficiaries in some ways. For this costing study we included some basic "ingredients" cost calculations of general societal cost elements that are considered time-intensive. These include the costs outlined below.

- **Beneficiary time and resources** spent in preparing locally available foods.
- **Local food vendor time and resources** spent to sell locally available foods or redeem vouchers. These could affect scalability and have been found to be a significant cost in prior research (Trenouth et al. 2018).
- **Volunteer support** (CNMs, LMs, FAs, and secretary/treasurer) to activities provided in the community may have implications for scale-up, particularly the question of whether they receive an incentive.
- **Value of in-kind storage space**, as relevant for each intervention (particularly for PUI).
- **Government opportunity costs,** such as costs to the government where the program relies on existing structures for implementation (e.g., joint supportive supervision).

Considerations for each of the above societal cost elements are provided below, including data needs required to estimate each of the societal cost elements.

Beneficiary time and resources

To assess beneficiary time and resources, we calculated time spent by beneficiaries participating in program activities, such as preparing foods, based on the following information:

1. Program staff estimates of the time required by beneficiaries per week.[1]
    a. For Tom Brown: Each week 12–15 caregivers plus one LM takes the first 3–4 days of each week to prepare Tom Brown and distribute take-home rations. We assessed how long they spend on average during each of these days for grinding the grain, food preparation, collecting clean water, giving/receiving counseling, and other relevant activities.
    b. For Porridge Mum: Each month 12–15 beneficiary PLW meet at the assigned kitchen (constructed for the program) for a cooking demonstration led by the group secretary. We assessed how long they spend on average during each of the cooking demonstrations for food preparation, collecting clean water, giving/receiving counseling, and other relevant activities. Secretaries and treasurers are tasked with procuring food ingredients from food vendors for the cooking demonstrations. While beneficiary PLWs are expected to replicate the recipe at home throughout the month, we did not assess their time spent preparing these meals.
2. We used an estimate of the most relevant local daily wage as a shadow wage (an estimated economic value of the resource when the market value is unavailable) for program beneficiaries in the calculations. For volunteer roles (e.g., LMs, FAs, secretary/treasurer, and sometimes CMNs) we assumed the published national minimum wage and for government staff, where relevant, we assumed the equivalent of a mid-range field-based Ministry of Health (MOH) supervisor.
3. Costs associated with using the grinding mill and/or time cost to walk to the mill vary by location (some interviewees reported long distances to walk to the mill).

Kitchen provision and construction

While no kitchen construction was necessary for Tom Brown, according to Tom Brown program staff LMs must use existing space within their homes to host Tom Brown group activities. Limitations in collecting this data and the opportunity cost of donated space for Porridge Mum kitchens are described in detail in the "Limitations" section.

Local food vendor time and resources

The transaction costs to local food vendors have been assessed through interviews with program staff during data collection and confirmed in the accounting data, including whether food vendors were paid service fees and if there was any information around the time spent by food vendors in selling locally available foods and ingredients.

Volunteer Support

Because activities provided by CNMs, LMs, FAs, and Porridge Mum secretaries/treasurers at the community-level may have implications for scale-up, we collected additional information on these activities and the costs associated with them. Data collected from the program staff interviews provided

[1] These estimates of beneficiary costs and time allocations came from program staff estimates. We did not interview any beneficiaries under the costing study.

additional information on the linkages between community-based volunteers, how their activities are aligned, which activities are compensated with incentives, and which are contributed in-kind, and what types of activities the volunteers are conducting in the communities. For any calculation of time spent, we used the same calculation method as described above for beneficiary time and resources. We also ensured that we did not double-count any contributions of LMs when calculating beneficiary time and LM time because LMs were also beneficiaries of the program.

Fieldwork and Data Management

Before data collection, the study team reviewed written documentation, including project guidance documents, evaluations, and enrollment data. During data collection, interviews focused on Borno-based staff where the main offices are located for the response in North East Nigeria and interviews with limited staff in Abuja. Field-based cost data collection was conducted in April 2023 and follow-up with additional data collection via teleconference and email from April–August 2023. The period of each program analyzed and other program features are summarized in table 4.

Semi-structured in-depth interviews were conducted with program staff (both individually and in groups) to collect the institutional and societal cost data. Technical staff answered questions included in the Data Collection Tool (annex 1). The same data collection tool was used to interview other program staff but the questions were more targeted. MEAL and broader Nutrition/FSL staff were included in group interviews, according to their availability, and MEAL staff were consulted to validate or collect data on the number of beneficiaries/children treated. Finance staff were interviewed to collect cost data, understand the finance systems, and better understand how to link existing costs to program activities. All qualitative interviews were confidential, and we are not reporting on any personal identifiers. The final number of interviews conducted per program was based on the program design and availability of staff for inclusion (see table 5).

Table 5. Number of Interviews Conducted per Program

Program	CRS Tom Brown	PUI Tom Brown	SCI Tom Brown	AAH Porridge Mum
No. interviews (individual and group)	12	5	5	8

The data have been compiled, compared, and extracted from the interview notes, and organized using a content analysis approach (including a framework of established content areas). This framework has been used to systematically review and extract relevant data from each interview and compare data in summary tables to identify commonalities or themes through an iterative process. The quantitative data (e.g., accounting data) were triangulated with the qualitative time allocation interview data by linking content area information to the corresponding cost area data.

Estimating the Costs of Local Foods

A common methodological choice to make in costing food commodities is whether to use a top-down or bottom-up approach (see table 6 for a summary of the approaches).

Table 6. Food Commodities Costing Approaches

Top Down Approach	Bottom Up Approach
Summary: Uses the bulk cost of procuring a shipment of food (usually from accounting or waybills), including any fees paid for shipment and freight. Through a series of steps, these lump sum costs are then divided into an estimate of the costs used per batch preparation. A benefit of the top-down approach is that you have the total cost of the food shipment so any wastage or spoiling would be accounted for in the total cost estimates. **Challenge:** It is required to calculate any security and local transport costs. The total cost of the food included may be different than the cost of the foods for the specific area assessed, so adjustments may be needed.	**Summary:** Bypasses these large lump sum costs and instead employs an "ingredients" approach to calculate the total cost of inputs used per beneficiary per week or per session. A benefit of the bottom-up approach is that it can be tailored to the specific geographic area and number of beneficiaries being assessed. **Challenge:** Like the top-down approach, these estimates do not account for wastage, spoilage, and any sharing practices at the household level. Estimated percentages can be applied to the calculations to represent a guess as to the extent of wastage, spoilage, and sharing.

The level of cost detail on local foods varies by program. Although the implementing partners' accounting databases contained information to assess whether and how the local food costs are included in the program costs, often the costs were a lump sum and did not include information on freight and transportation. We attempted to collect cost data from each program's market assessments on the food commodities to enable a bottom-up approach to estimate a more context-specific cost. Where available detail was insufficient (e.g., for Porridge Mum), we deferred to a top-down approach.

Limitations

While disaggregation of costs by activity has allowed for a robust assessment of important cost drivers for each partner, this was limited in some cases due to retrospective assessment. Although this approach is the most appropriate given the time and resource limitations for implementing this study, it relies on the availability and accuracy of the original cost and programmatic databases and cost recording systems, meaning that accuracy and reliability can vary widely across programs (Luce et al. 1996; Slothuus 2000).

Collecting Specific Institutional Costs

Because the Tom Brown and Porridge Mum approaches are embedded within and rely on existing nutrition and FSL structures, we had to make assumptions about how to apportion those nutrition and FSL costs to the Tom Brown and Porridge Mum programs.

Additionally, the structure of the implementing partners' individual accounting databases sometimes created limitations to collect specific costs. For example, we could not isolate the costs related to CRS' cash/voucher component implemented in the peri-urban area in the direct supplementation cost category. We were also unable to estimate some of PUI's shared/overhead costs, making their cost per child enrolled potentially underestimated.

Collecting Specific Societal Costs

Despite it being a consistent requirement of Tom Brown LMs that they have a donated space available in their homes (and agreement from their husbands) for use throughout the session period to prepare the

locally available foods, we could not assess the opportunity cost of the donated kitchen space because we did not conduct interviews with LMs. Program staff did not know further details about the individual spaces or electricity needs of the kitchen spaces, just that each LM must have that space available in their homes. For any calculation of time spent by community-based volunteers, estimates were provided by program staff in the absence of interviews directly with volunteers. Similarly, data collected on the opportunity costs to food vendor resources was estimated through interviews with program staff in the absence of interviews with food vendors themselves.

Additionally, the opportunity cost of the land donated for Porridge Mum kitchen construction, especially government and community owned land, is difficult to value. However, this donated space is essential to the scale-up of the Porridge Mum approach.

Estimating the Number of Beneficiaries

Each program implementing partner collected program monitoring data on the number of beneficiary mothers and PLW included in the groups, but only CRS and SCI directly tracked the number of moderately wasted children enrolled. PUI and AAH tracked the number of mothers and PLW group members respectively and assumed a 1:1 ratio of mothers/PLW to child for the cost-efficiency estimation. Upon review, AAH agreed that the 1:1 ratio was accurate to account for variations (e.g., some women have more than one child and some PLWs do not have an enrolled child).

Ethics and Confidentiality

Verbal informed consent was sought before each interview, which clearly stated that participation was voluntary and also explained the purpose of the study and how the data will be used. The informed consent statement also informed respondents that participating involved minimal risk given the non-sensitive nature of the data that was collected and that we kept their identity confidential to the maximum extent possible. Names, titles, and contact details were collected to facilitate the organization of interviews, but this information is not included in our external reporting. Identifying information for program beneficiaries was not collected as part of the costing study. All hardcopy data was stored in a locked room, whenever possible. Electronic data was stored on password-protected devices, and we used secure Google Drive folders to transfer data electronically to USAID Advancing Nutrition.

Incentives

All in-person data collection took place at the place of work of the respondents or at the service delivery site. Therefore, participants in the study did not receive transportation reimbursements or any other incentives.

Risk to Subjects

All risks to those participating in this study were minimal and no more dangerous than what a participant might experience in his or her daily activities. There were no additional costs to the subjects for participating in this study.

Results

This section provides an overview of the cost-efficiency results for each Tom Brown and Porridge Mum program, including a description of how each of the four implementing partners delivered the programs in North East Nigeria. A synthesis of the results across partners and an explanation of the different cost drivers for each partner is in the Discussion section.

Tom Brown

This section presents the findings for each of the Tom Brown implementing partners.

CRS

Program Description

CRS has a long history of including Tom Brown as part of its nutrition activities in Nigeria as part of its work to support orphans and vulnerable children and broader food security and nutrition efforts. The USAID-funded Feed the Future Nigeria livelihoods projects and the Sustainable Mechanisms for Improving Livelihoods and Household Empowerment (SMILE) project, implemented from 2013–2018, provided caregivers with the Tom Brown flour to make porridge for moderately wasted children at home. In 2018, CRS Nigeria decided to expand the use of Tom Brown into a humanitarian context to close an identified gap in services for children with moderate wasting. CRS and its partners Justice, Development, and Peace Commission (JDPC) and North East Youth Initiative Forum (NEYIF) piloted and scaled-up the Tom Brown supplementary feeding program in six local government areas (LGAs) across Borno and Yobe states. JDPC and NEYIF continue to provide support to CRS to implement Tom Brown programs, including all the direct community-level implementation, within defined LGA catchment areas.

CRS implementation of Tom Brown begins with selecting LMs to facilitate the groups, and advocacy and sensitization activities to inform caregivers about the mass MUAC screening of children aged 6–59 months. All moderately wasted children are enrolled in a Tom Brown group, and severely wasted children are referred to the nearest outpatient treatment program. CNMs conduct sensitization activities. CRS used slightly different program models in its rural and peri-urban implementation areas. In peri-urban areas, CRS shifted to using cash and vouchers rather than in-kind food items to produce the Tom Brown flour. For peri-urban areas, CRS also selects two assistant beneficiary mothers who support the LMs in their duties, including purchasing the local food items from vendors.

The CRS Tom Brown approach follows their *Tom Brown Implementation Guidelines* and uses a 6:3:1 ratio of ingredients (CRS 2021). Each child received 1.5 kg of the Tom Brown flour once a week. Caregivers are instructed to provide children with approximately 214 grams (g) of the flour prepared as a porridge per day, in two to three servings, in addition to their usual meals. Children's MUAC is monitored weekly throughout the program; children who deteriorate into severe wasting are referred for treatment through outpatient or inpatient services, as appropriate. Although MUAC is monitored, children stay in the program for the full period, even if they achieve a healthy MUAC (MUAC ≥ 125 mm) before the program ends. In rural areas, CRS procures food ingredients in bulk and stores them for a maximum of four weeks in their warehouse and field-based satellite houses. They deliver the ingredients to the LM's household for weekly storage (depending on the location, some delivered on a different schedule are stored in the household for slightly longer). The groups follow a seven-day schedule: three days are for the food preparation and then the flour is taken home (each group selects a schedule that works best for them). They follow the schedule for eight weeks. During the eight weeks, a group of 12 caregivers meet at the LM's home for flour preparation and also take part in a weekly nutrition education session.

The flour preparation process lasts for three days:

- Day 1: provide, clean, and wash the grains
- Day 2: dry the grains; soak and deshell the soya beans
- Day 3: grind the grains, prepare and distribute the flour.

Ingredients and Materials Provided per Group

Ingredients (weekly amounts per group): Soya (8 kg), millet (8 kg), sorghum (8 kg), ground nut (2.7 kg), cloves (.5 kg)
Materials: LM kitchen kits and equipment and MUAC tape.

CRS Results

Total program costs:
Through its Tom Brown program, CRS facilitated a total of 1,081 groups and enrolled 12,890 moderately wasted children (6,875 females and 6,015 males) between June 2021 and April 2023. The total program cost for the 23 months of implementation was U.S.$2,375,729.61, resulting in an estimated U.S.$184.31 per child enrolled. Table 7 summarizes the total institutional and societal costs by cost category and figure 3 illustrates the percent of total costs by cost category. A more detailed breakdown of total institutional and societal costs by cost category is presented in annex 2.

Table 7. Total Institutional and Societal Tom Brown Expenditures by Cost Category—CRS (U.S.$)

Cost Category	Cost by Category (U.S.$)
Institutional costs (CRS and partners)	
Supplementation	1,481,004.86
Community	83.61
Supply	52,947.93
Training	42,984.66
Supervision	355,117.54
Management	308,611.52
Kitchen construction	n/a
Societal Costs	
Societal	134,979.49
TOTAL	**2,375,729.61**

Figure 3. Total Institutional and Societal Tom Brown Intervention Expenditures by Cost Category, CRS (%)

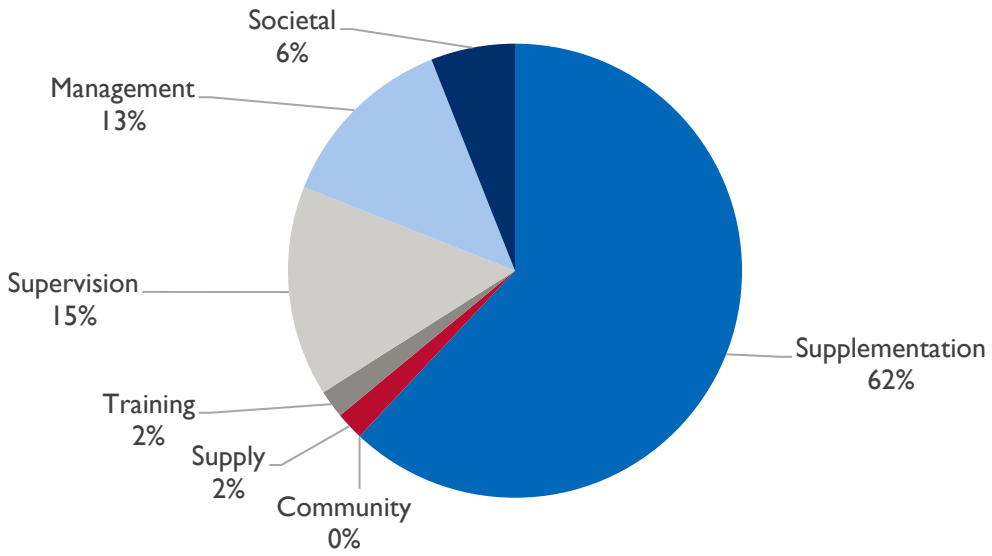
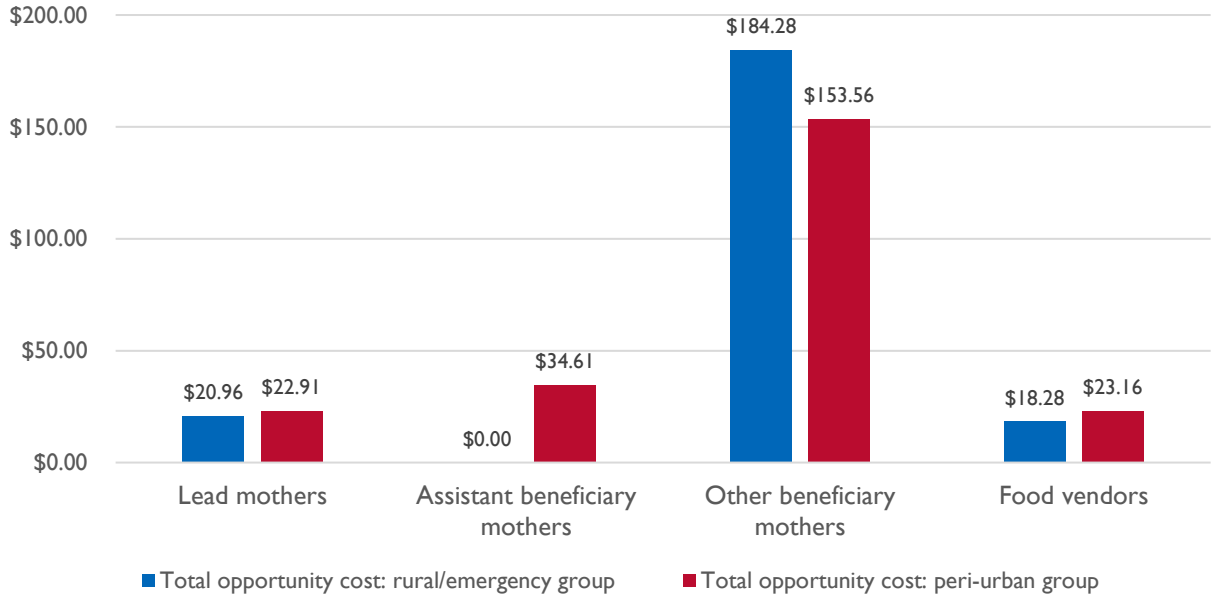


Figure 4 provides a breakdown of the costs included in the total societal costs summarized in table 7. Costs for LMs, assistant beneficiary mothers, and other beneficiary mothers were calculated separately, as they all have slightly different roles and, therefore, different opportunity costs for participation in the Tom Brown groups. In the CRS model, because CNMs are paid a wage by the implementing partner they are not included in societal cost calculations. The assistant beneficiary mothers' role only exists in peri-urban areas where there is additional work required to purchase the food items using the cash/vouchers. Therefore, these costs are only calculated for these program sites.

There are societal costs of food vendors in both the rural/emergency and peri-urban models, as CRS brings food vendors associated with both models in for a three-week training period and routine quality assurance checks without any direct compensation for their time. The vendors are, however, given prioritized sales opportunities through the program. However, the societal cost to food vendors is greater in the peri-urban model because of the time the food vendors spend with LMs to redeem their vouchers for food ingredients, process paperwork, and engage with CRS staff on quality assurance activities.

Figure 4. Societal Costs by Volunteer Type Across Program Models (Per Peri-Urban and Rural Group), CRS



Total program costs per Tom Brown group

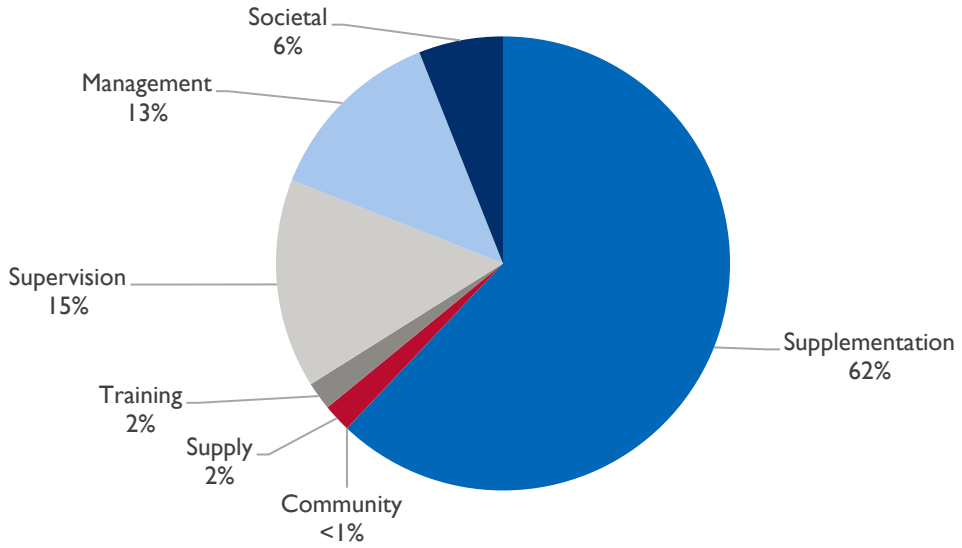
Table 8 and figure 5 summarize the total institutional and societal costs per CRS Tom Brown group and the percent of total institutional and societal costs by cost category per the Tom Brown group. See annex 3 for a more detailed breakdown of total institutional and societal costs per group, by cost category.

Table 8. Total Institutional and Societal Costs per Tom Brown Group, Eight-Week Cycle—CRS (U.S.$)

Cost Category	Cost by Category (U.S.$)
Institutional Costs (CRS and partners)	
Supplementation	2,493.27
Community	0.14
Supply	89.14
Training	72.36
Supervision	597.84
Management	519.55
Kitchen construction	n/a
Societal Costs	

Societal	227.24
TOTAL	**3,999.54**

Figure 5. Total Institutional and Societal Costs per Tom Brown Group, 8-week Cycle, CRS (%)



While table 8 and figure 5 summarize the total institutional and societal costs of Tom Brown per group, table 9 and figure 6 illustrate the direct costs for each of CRS' Tom Brown groups (excluding shared management costs of the program). Table 9 summarizes the direct costs for each of CRS' Tom Brown groups (excluding shared management costs of the program) and figure 6 shows the percent of total direct costs by cost type per Tom Brown group. The shared costs that have been excluded include program management, supervision, training, community outreach, and shared indirect costs.

The direct costs per the Tom Brown group are estimated to illustrate the potential direct cost per group at scale, excluding those up-front investments and shared management costs, such as capital costs and staff capacities that will average out over time.

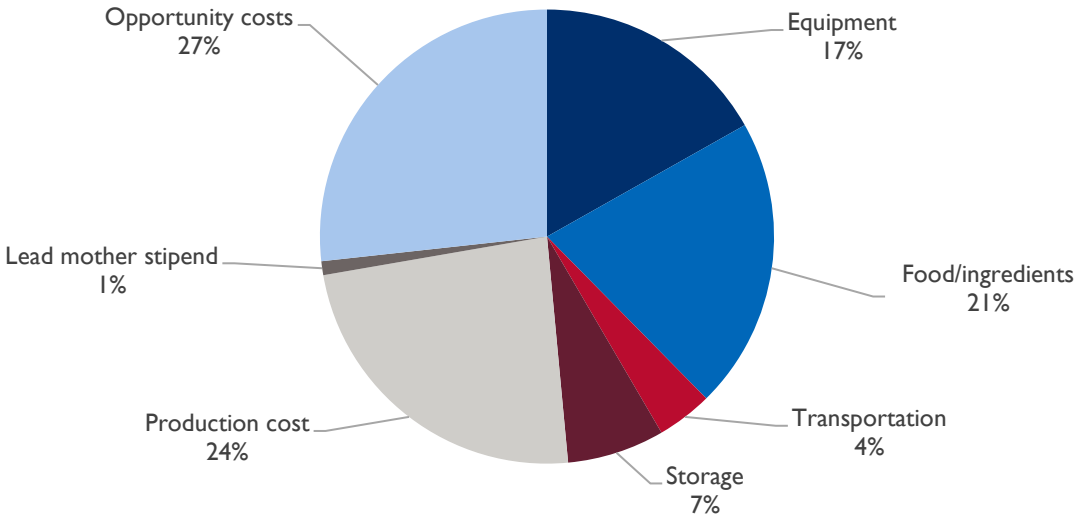
Table 9. Direct Costs per CRS Tom Brown per Group for an Eight-Week Cycle2

Cost Type	Total Direct Cost (U.S.$)
Institutional Cost (CRS and partners)	
Equipment per group (gifted to LMs)	148.48
Food/ingredients	177.11

[2] Some of the direct costs in table 9 were provided by CRS through interviews and data separate from their accounting records.

Cost Type	Total Direct Cost (U.S.$)
Transportation[3]	30.29
Storage	58.85
Production cost (including cooking demonstration)	202.82
LMs stipend	4.55
Societal Costs	
Opportunity cost for LMs, assistant beneficiary mothers, other beneficiary mothers, and vendors (weighted average from both CRS models)[4]	227.24
TOTAL	**849.33**

Figure 6. Percent of Direct Costs by Cost Type per Tom Brown Group, 8-week Cycle, CRS (%)



PUI

Program Description

PUI implements a full package of nutrition activities in North East Nigeria, including support to inpatient and outpatient treatment of severe wasting in Maiduguri and Monguno. In Monguno, PUI also supports the management of moderate wasting using the Tom Brown approach. Enrollment of children for Tom Brown is done by CNMs through routine MUAC assessments.

[3] Transportation and storage costs are assumed to be under-reported compared to expected costs of their storage model (using satellite offices in the rural/emergency areas). It is likely that some of these shared costs were not apportioned to CRS' nutrition department and, therefore, not apportioned to Tom Brown.
[4] CRS has two separate operating models of its Tom Brown approach, one in the rural/emergency area and one in the peri-urban area. Each model has separate associated costs. To estimate the cost per group we used a weighted average of the two.

PUI uses the same Tom Brown recipe as provided in the CRS *Tom Brown Implementation Guidelines* following the 6:3:1 ratio, but they provided the groups with slightly higher amounts of each food item. Weekly ration size, portion guidance, and MUAC monitoring is the same as the CRS program and as per the CRS *Tom Brown Implementation Guidelines*. PUI procures the food ingredients from local food vendors and stores them in a central WFP storage facility in Monguno at no cost to the program. Ingredients are purchased in bulk for each Tom Brown cohort from local food vendors near the warehouse in Monguno. For delivery to the LMs' homes, a request is submitted from PUI to WFP for release of food ingredients from the warehouse. PUI staff pick-up the ingredients and transport them to the LMs' homes once a week. The groups follow a seven-day schedule: three days are for flour preparation and then the flour is taken home. Like CRS, PUI's Tom Brown sessions last for eight weeks. PUI's transactional cost data does not include any storage costs for food ingredients because the program relies on storage space donated by WFP. The value of this storage space was estimated based on the size of the space, the amount of space being utilized by the Tom Brown ingredients, and the value of comparable storage facilities in the area.

The steps of PUI's Tom Brown approach include CNMs screening of children for moderate wasting, selection of LMs, weekly refresher training of LMs, and preparation and distribution of flour. In addition, CNMs provide infant and young child feeding and hygiene counseling to LMs and other beneficiary mothers in the groups and taking weekly MUAC measurements.

The flour preparation process takes three days:

- Day 1: provide, clean, and wash the grains; soak the soya beans and cereals
- Day 2: dehusk the soya beans, dry the grains
- Day 3: roast and dry the soya beans, lightly roast the sorghum and millet, mix ingredients, grind the grains, prepare and distribute the flour.

Ingredients and Materials per Group

Ingredients (weekly amounts per group): soya beans (9 kg), millet (9 kg), sorghum (9 kg), ground nut (3 kg)

Materials: Rubber bowl, frying pan, trays, measuring containers, firewood stove, airtight containers, cups with covers, mat, colander, and frying spoon. PUI also provides hygiene kits and NFIs, such as soaps to beneficiary mothers during graduation.

PUI Results

Total program costs

Through its Tom Brown program, PUI facilitated a total of 160 groups, over four eight-week sessions, and enrolled 1,920 moderately wasted children between January 2021–June 2023. The total program cost for the 30 months was U.S.$297,509.70, resulting in an estimated U.S.$154.95 per child enrolled. Table 10 summarizes the total and societal costs by cost category and figure 7 illustrates the percent of total costs by cost category. A more detailed breakdown of total institutional and societal costs by cost category is presented in annex 4.

Table 10. Total Institutional and Societal Tom Brown Expenditures by Cost Category—PUI (U.S.$)

Cost Category	Cost by Category (U.S.$)
Institutional Costs (PUI)	

Supplementation	206,718.50
Community	10,360.42
Supply	3,915.42
Training	13,848.35
Supervision	36,625.84
Management	11,324.70
Kitchen construction	n/a
Societal Costs	
Societal	14,716.00
TOTAL	**297,509.70**

Figure 7. Total Institutional and Societal Tom Brown Intervention Expenditures by Cost Category, PUI (%)

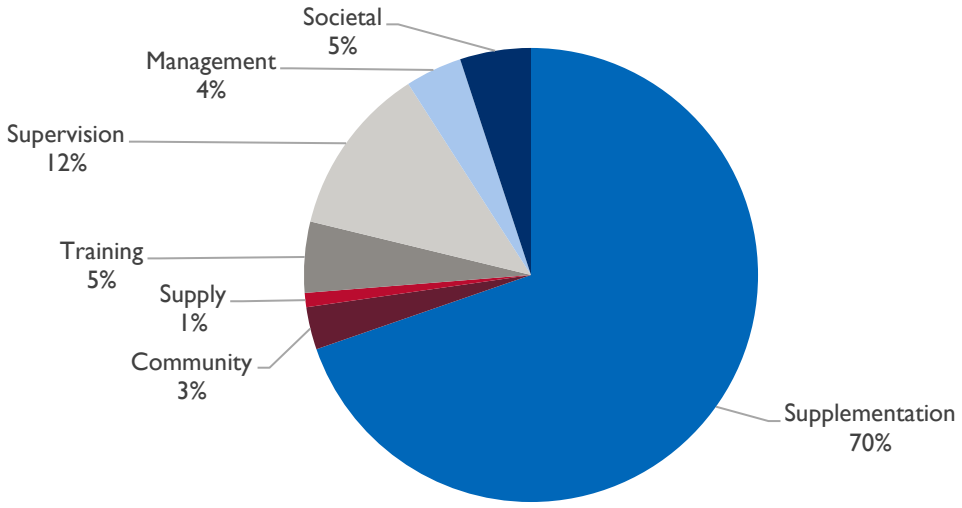
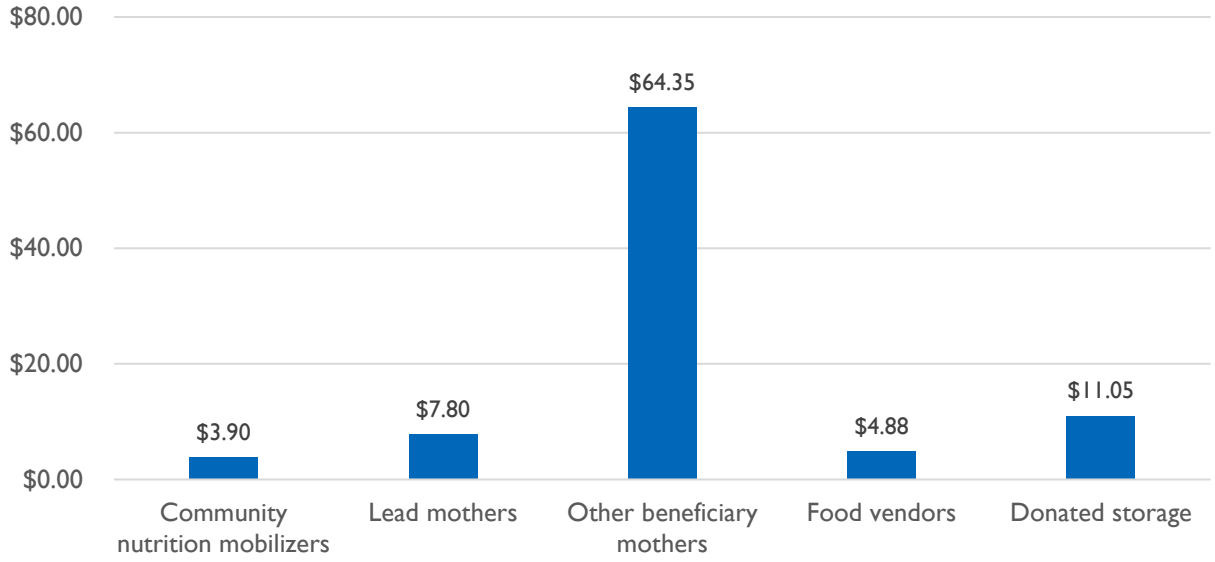


Figure 8 provides a breakdown of the costs included in the total societal costs summarized in table 10. Costs for CNMs, LMs, and other beneficiary mothers were calculated separately, as they all have slightly different roles and, therefore, opportunity costs for participation in the Tom Brown groups. In the PUI model, CNMs are volunteers, only being paid a small stipend and are, therefore, included in societal cost calculations. PUI procures food ingredients from local food vendors in bulk and stores them in a central WFP storage facility in Monguno at no cost to the program. Societal costs for food vendors in the PUI model include the time spent engaged in routine quality assurance conducted by PUI staff. We also included the opportunity cost of the donated storage space.

Figure 8. Societal Costs by Volunteer Type (Per Group), PUI



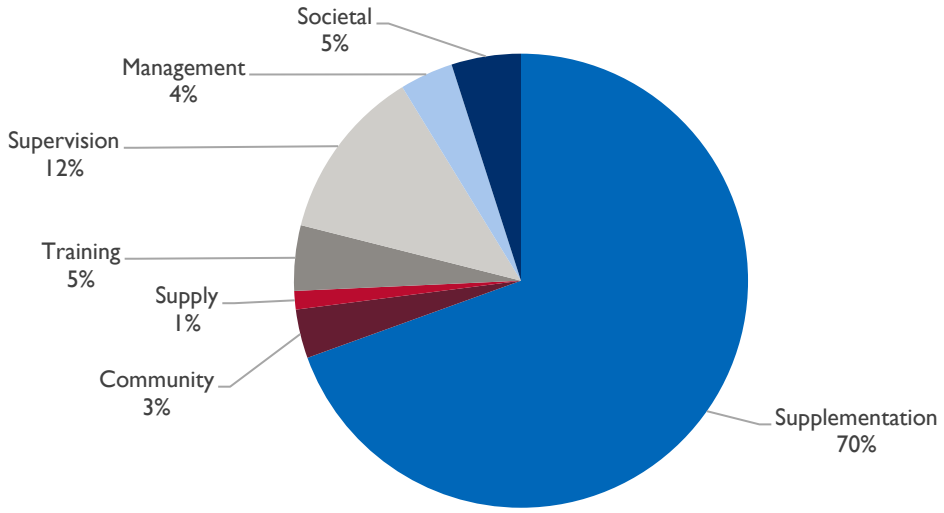
Total program costs per Tom Brown group

Table 11 and figure 9 summarize the total institutional and societal costs per PUI Tom Brown groups and the percent of total institutional and societal costs by cost type, per Tom Brown group. A more detailed breakdown of total institutional and societal costs per group, by cost category, is presented in annex 5.

Table 11. Total Institutional and Societal Costs, per Tom Brown Group, Eight-Week Cycle—PUI (U.S.$)

Cost Category	Cost by Category (U.S.$)
Institutional Costs (PUI)	
Supplementation	1,291.00
Community	64.75
Supply	24.47
Training	86.55
Supervision	228.91
Management	70.78
Kitchen construction	n/a
Societal Costs	
Societal	91.98
TOTAL	**1,859.44**

Figure 9. Total Institutional and Societal Costs per Tom Brown Group, 8-week Cycle, PUI (%)



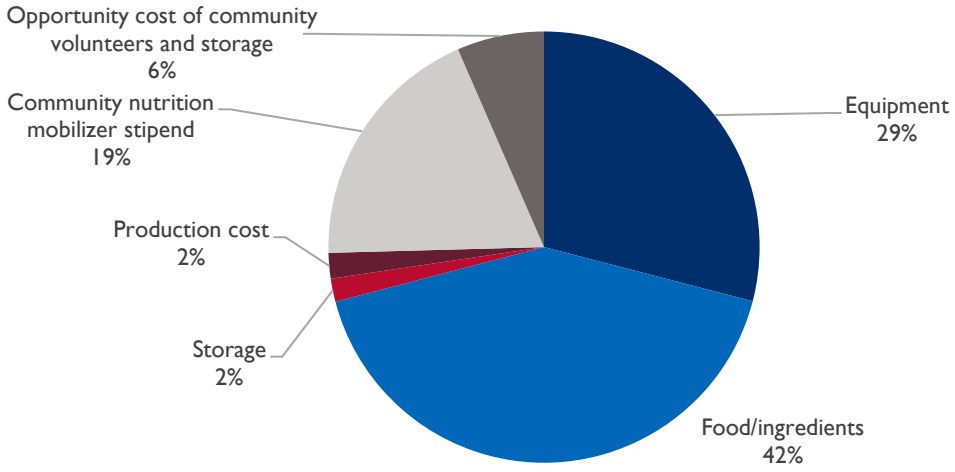
While table 11 and figure 9 summarize the total institutional and societal costs of Tom Brown per group, table 12 and figure 10 illustrate the direct costs for each of PUI's Tom Brown groups (excluding shared management costs of the program). Table 12 summarizes the direct costs for each of PUI's Tom Brown groups (excluding shared management costs of the program) and figure 10 shows the percent of total direct costs by cost type per Tom Brown group. The excluded shared costs include program management, supervision, training, community outreach, and shared indirect costs.

Table 12. Direct Costs per Tom Brown Group, Eight-Week Cycle—PUI (U.S.$)

Cost Type	Total Direct Cost (U.S.$)
Institutional Cost (PUI)	
Equipment per group	409.05
Food/ingredients	589.80
Transportation	-
Storage (excluding the donated storage space)	24.47
Preparation cost (grinding, transport, firewood, and water)	27.01
CNM and FA stipend	136.51
LM stipend	129.63
Societal Costs	
Opportunity cost of community volunteers (LMs, CNMs, other beneficiary mothers, vendors, and donated storage)	91.98

Cost Type	Total Direct Cost (U.S.$)
TOTAL	**1,408.44**

Figure 10. Direct Costs per Tom Brown Group, 8-week Cycle, PUI (%)



SCI

Program Description

As part of SCI's integrated program, "Integrated lifesaving assistance for conflict-affected households in Borno, Nigeria," which began in July 2021, SCI is implementing nutrition activities including both preventive (maternal infant and young child nutrition) and curative (CMAM) components. The CMAM components involve routine MUAC screening and referral of wasted children under five, management of severe wasting in inpatient and outpatient treatment sites, the Tom Brown approach to manage moderate wasting, and Community Management of At-Risk Mothers and Infants services.

SCI uses the same Tom Brown recipe as provided in the CRS *Tom Brown Implementation Guidelines*, following the 6:3:1 ratio. Weekly ration size, portion guidance, and MUAC monitoring is the same as in the CRS program and as per the CRS *Tom Brown Implementation Guidelines*. Beneficiary mothers also receive infant and young child feeding messaging and are facilitated through an assessment of challenges and root causes of malnutrition in the household (i.e., hygiene, breastfeeding difficulties, etc.). SCI procures Tom Brown ingredients and stores them at the central Maiduguri office/warehouse. They are delivered to Tom Brown groups once a week to avoid issues with storage at the site (LM's house) and issues with food ingredients. SCI works with a local partner, Green Code, to procure the grains, delivery to the community once a week, enrollment through field assistants, and supervision of groups by nutrition officers. The groups follow a seven-day schedule. Four days are for food preparation and then the flour is taken home. SCI implements Tom Brown on a 10-week cycle, which is two weeks longer than the CRS and PUI programs. During the 10 weeks, a group of 6–12 caregivers convene at the LM's home for weekly flour preparation.

The steps of SCI's Tom Brown approach include active case finding by CNMs, identification of a group facilitator (LM), and the production of the Tom Brown flour. LMs also receive counseling and materials.

The food preparation process lasts four days:

- Day 1: provide, clean, and wash the grains
- Day 2: dry the grains; soak and deshell the soya beans
- Day 3: dry the grains
- Day 4: grind the grains, prepare and distribute the flour.

Ingredients and Materials Provided per Group

Ingredients (weekly amounts per group): soya (8 kg), millet (8 kg), sorghum (8 kg), ground nut (2.7 kg), cloves (.5 kg)

Materials: Mat, rubber cups, airtight containers, pots with cover, frying pan, perforated frying spoons, ladle, colander, plastic bags, empty sack, local trays, rubber bowls, hand washstand, liquid hand wash, measuring containers, rubber bucket, and masks.

SCI Results

Total program costs

Between June 2021–April 2023, SCI facilitated a total of 315 Tom Brown groups and enrolled 3,376 moderately wasted children (1,934 females and 1,442 males) in the program. The total program cost for the 23 months was U.S.$1,666,723.32, resulting in an estimated U.S.$493.70 per child enrolled. Table 13 summarizes the total institutional and societal costs by cost category and figure 11 illustrates the percent of total cost by cost category. A more detailed breakdown of total institutional and societal costs by cost category is presented in annex 6.

Table 13. Total Institutional and Societal Tom Brown Expenditures by Cost Category—SCI (U.S.$)

Cost Category	Cost by Category (U.S.$)
Institutional Costs (SCI and partner)	
Supplementation	889,744.62
Community	18,533.62
Supply	117,396.61
Training	10,797.72
Supervision	190,847.23
Management	350,845.13
Kitchen construction	n/a
Societal Costs	
Societal	88,558.40
TOTAL	**1,666,723.32**

Figure 11. Total Institutional and Societal Tom Brown Intervention Expenditures by Cost Category, SCI (%)

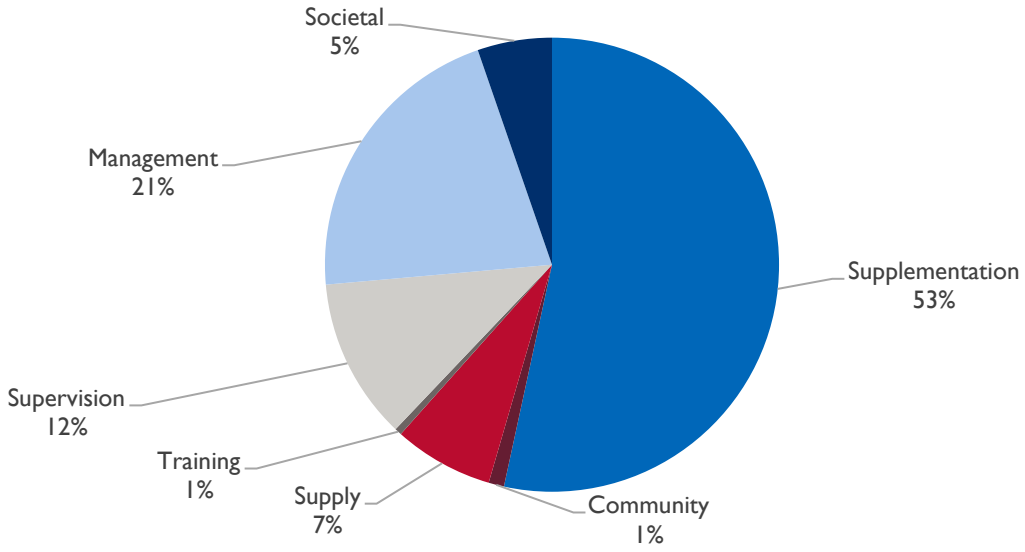
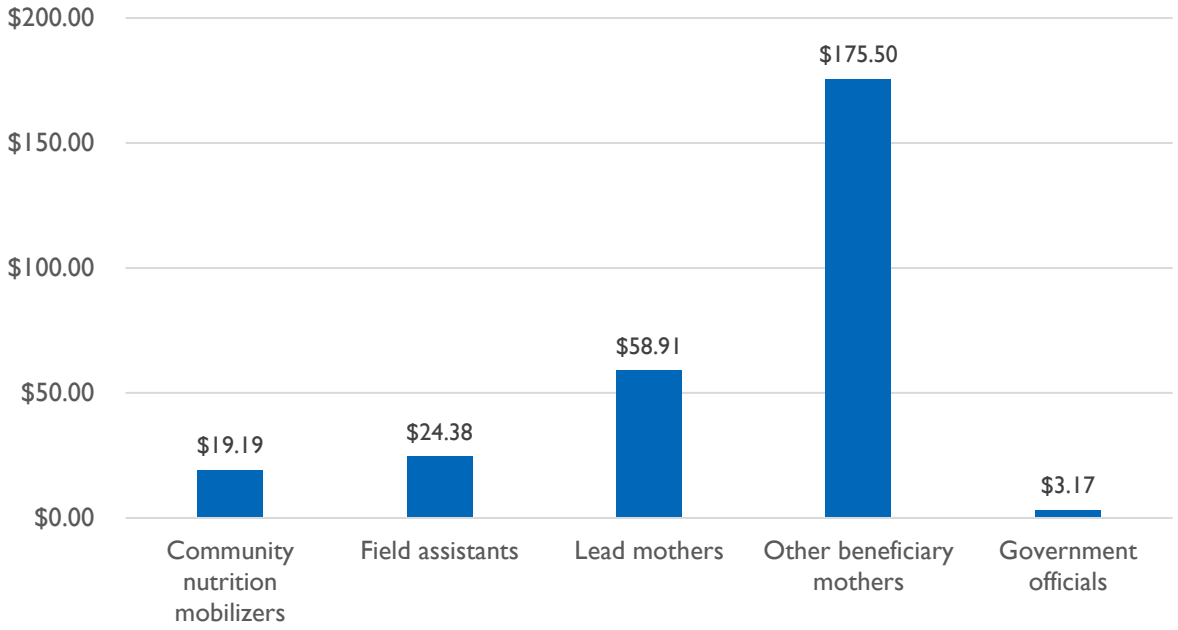


Figure 12 provides a breakdown of the costs included in the total societal costs summarized in table 13. Costs for CNMs, FAs, LMs, and other beneficiary mothers were calculated separately, as they all have slightly different roles and, therefore, opportunity costs for participation in the Tom Brown groups. In the SCI model, CNMs are volunteers, are only paid a stipend and are, therefore, included in societal cost calculations. Additionally, SCI has recruited volunteer field assistants who spend part of their day, five days per week on Tom Brown activities, including screening and enrollment, while only receiving a small stipend. The opportunity cost of MOH staff involved in joint supportive supervision has been assessed and included.

Figure 12. Societal Costs by Volunteer Type (Per Group), SCI



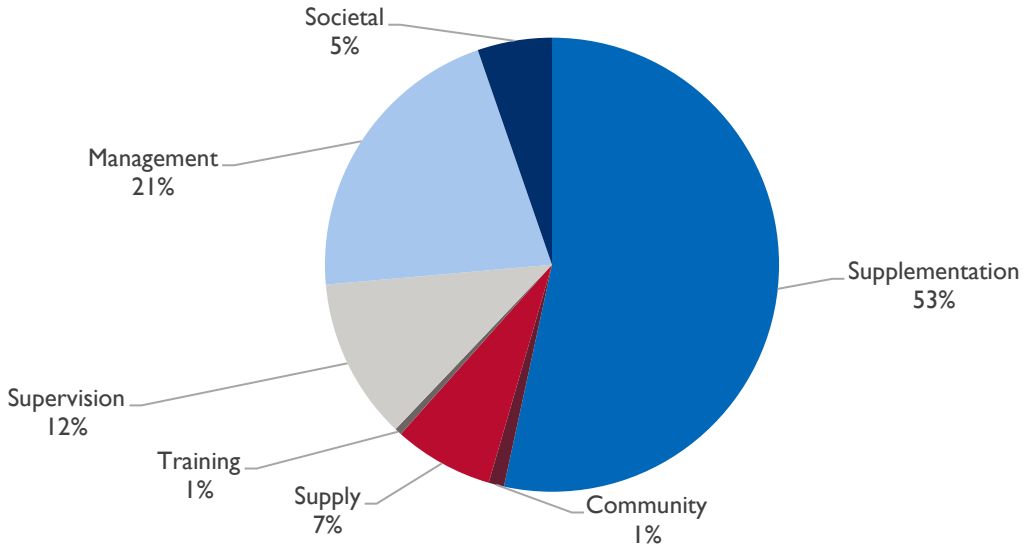
Total program costs per Tom Brown group

Table 14 and figure 13 summarize the total institutional and societal costs per SCI Tom Brown group and the percent of total institutional and societal costs, by cost type, per Tom Brown group. A more detailed breakdown of total institutional and societal costs per group, by cost category, is presented in annex 7.

Table 14. Total Institutional and Societal Costs, Tom Brown per Group, 10-Week Cycle—SCI (U.S.$)

Cost Category	Cost by Category (U.S.$)
Institutional Costs (SCI and partner)	
Supplementation	2,824.59
Community	58.84
Supply	372.69
Training	34.28
Supervision	605.86
Management	1,113.79
Kitchen construction	n/a
Societal Costs	
Societal	281.14
TOTAL	**5,291.19**

Figure 13. Total Institutional and Societal Costs per Tom Brown Group, 10-week Cycle, SCI (%)



While table 14 and figure 13 summarize the total institutional and societal costs of Tom Brown per group, table 15 and figure 14 illustrate the direct costs for each of SCI's Tom Brown groups (excluding shared management costs of the program). Table 15 summarizes the direct costs for each of SCI's Tom Brown groups (excluding shared management costs of the program) and figure 14 shows the percent of total direct costs, by cost type, per Tom Brown group. The excluded shared costs include program management, supervision, training, community outreach, and shared indirect costs.

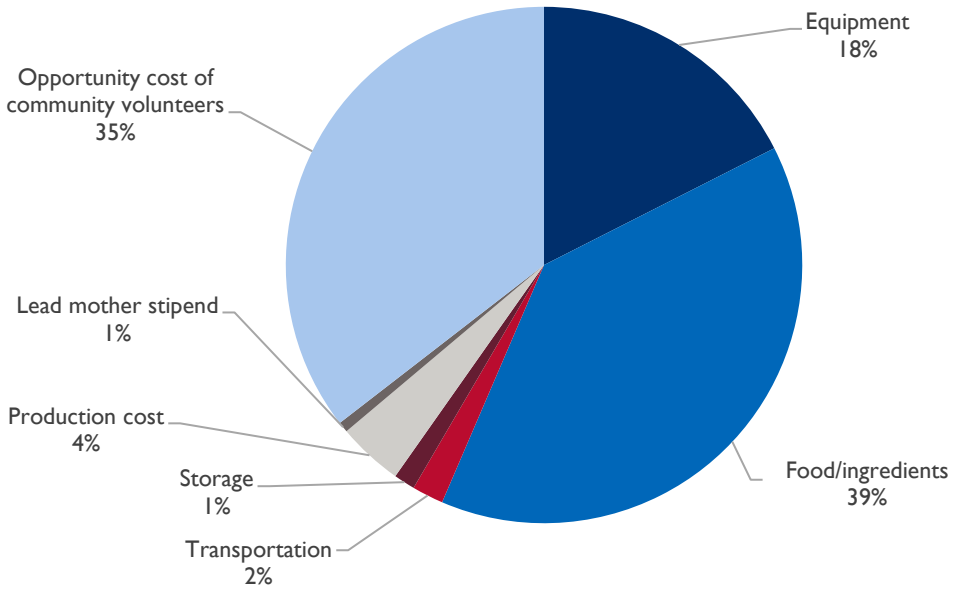
Table 15. Direct Costs per Tom Brown Group, 10-Week Cycle—SCI (U.S.$)[5]

Cost Type	Total Direct Cost (U.S.$)
Institutional Cost (SCI and partner)	
Equipment per group	138.91
Food/ingredients	308.49
Transportation	15.60
Storage	10.61
Preparation cost (grinding, transport, firewood, and water) including cooking demos	32.50
LM stipend	5.20
Societal Costs	
Opportunity cost of community volunteers (LMs, CNMs, FAs, other	281.14

[5] Some of the direct costs in table 15 were provided by SCI through interviews and data separate from their accounting records.

Cost Type	Total Direct Cost (U.S.$)
beneficiary mothers, MOH staff, and vendors)	
TOTAL	**792.44**

Figure 14. Direct Costs per Tom Brown Group, 10-week cycle, SCI (%)



Porridge Mum

This section describes the results from AAH's Porridge Mum approach.

AAH

Program Description

AAH's Porridge Mum intervention is not a stand-alone approach, rather it is integrated into an existing cash and voucher assistance program for food assistance. As part of this approach, AAH hired a local vendor to construct demonstration kitchens on land either donated by the host communities or by the LGA. Beneficiary women are selected based on a household vulnerability scoring system. Pregnant and lactating women and girls of reproductive age (15–49 years) and their children who are 6–24 months of age are eligible for enrollment. The nutritional status of the woman or child is not a criterion for enrollment.

AAH staff conduct the cooking demonstrations and decide on the nutritious recipes to cook based on seasonal availability of food items and cultural appropriateness. The recipes used included Tom Brown flour, jollof rice with spinach/moringa, beans porridge, yam and beans porridge, Irish potatoes porridge, and *tuwo* (maize flour) with okra soup.[6] Amounts used for cooking demonstrations are calculated according to the size of the group (most groups have 12–15 beneficiary mothers). Unlike in the Tom

6 These recipes were adapted from the *SPRING Nigeria Complementary Feeding and Cooking Demonstration Manual.*

Brown approach, rations are not provided to take home, but women are given an additional voucher to purchase the ingredients and make the recipes at home. During cooking demonstrations, women meet at the communal kitchen to learn the new recipe. At these sessions, the food prepared is consumed by the women in the group and any children under the age of two. No other community members are allowed to eat the prepared food. Women are then encouraged to use their individual top-up vouchers to purchase the ingredients and replicate the meals at home. Women are encouraged to make one of the Porridge Mum recipes per day. Tom Brown flour is included among the Porridge Mum recipes but no specific guidance on additional feeding for moderately wasted children is provided. This is likely because Porridge Mum is not designed as a wasting management program. Key informants did not provide additional details about how Tom Brown has been incorporated into Porridge Mum. In addition to the cooking demonstrations, beneficiary mothers also receive monthly health education sessions and MUAC screening for their children.

Each Porridge Mum group has a secretary and treasurer, who are tasked with procuring food ingredients from local food vendors once a month using a provided Smart Card worth 35,000 Naira. Secretaries also receive a monthly 15,000 Naira cash voucher to cover transportation, water, firewood, and milling/grinding costs. Other beneficiary mothers receive a 5,000 Naira cash voucher per month to purchase food ingredients, which they contribute to the group, and to purchase food ingredients to replicate the recipes at home.

While the ingredients storage model employed by AAH dictates that food ingredients and NFIs for the cooking demonstration are only stored in the secretaries' homes once a month ahead of the group cooking demonstrations, this opportunity cost was not captured in AAH's transactional cost data. We could not place a value on this opportunity storage cost without site visits to the secretaries' homes to estimate the size of the storage space or interviewing the secretaries. However, the opportunity cost is estimated to be very low, given that the food is procured by the secretaries once a month and used shortly after procurement, thus only needing storage in their homes for a short period of time.

Ingredients and Materials Provided per Group

Ingredients used for monthly cooking demonstrations (exact items procured vary based on selected recipes): maize, processed rice, biski/maize grit, brown beans, white beans, dry peppers, cassava flour/garin kwaki, vegetable oil, palm oil, iodized salt, sugar, millet, groundnut seed, maggi, spaghetti sachet, eggs, bournvita powder, milk powder, Irish potatoes, tomato paste, curry powder, sardines, smoked fish, onga sachet, semolina, couscous, and wheat flour.

Materials: mat, plastic buckets with lids, hijabs, note pads, t-shirts (others not listed outright).

Results

Total program costs

Through its Porridge Mum program, AAH facilitated 67 groups and enrolled 1,872 PLW and children[7] between November 2022 and May 2023. The total program cost for the seven months was U.S.$790,643.26, resulting in an estimated U.S.$422.35 per beneficiary enrolled. Table 16 summarizes the total institutional and societal costs by cost category and figure 15 illustrates the percent of total costs by cost category. A more detailed breakdown of total institutional and societal costs by cost category is presented in annex 8.

[7] The number of beneficiaries enrolled is based on an assumed ratio of 1:1 (PLW to child).

Table 16. Total Institutional and Societal Porridge Mum Expenditures by Cost Category—AAH (U.S.$)

Cost Category	Cost by Category (U.S.$)
Institutional Costs (AAH)	
Supplementation	269,852.96
Community	21,544.77
Supply	43,232.46
Training	27,770.43
Supervision	55,073.41
Management	274,236.78
Kitchen construction	78,967.50
Societal Costs	
Societal	19,964.95
TOTAL	**790,643.26**

Figure 15. Total Institutional and Societal Porridge Mum Intervention Expenditures by Cost Category, AAH (%)

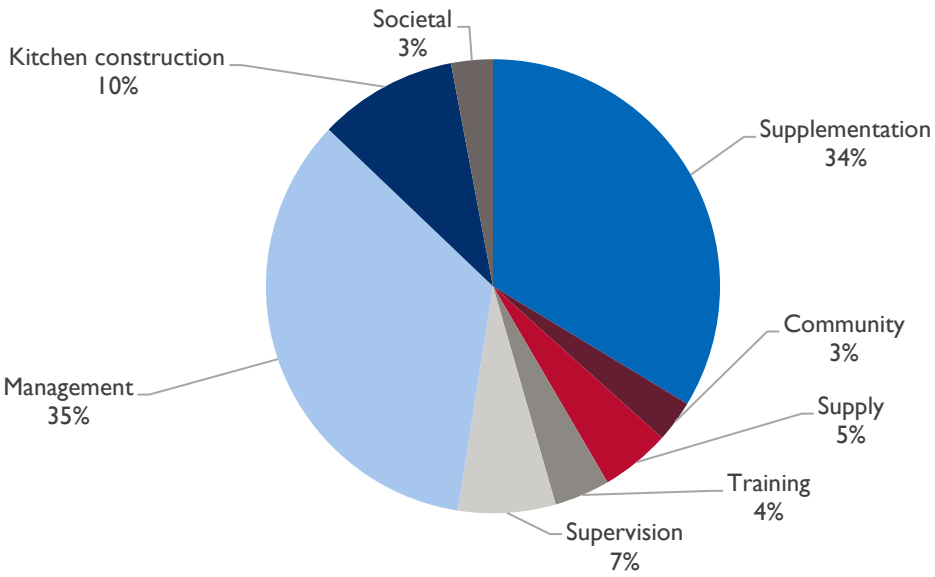
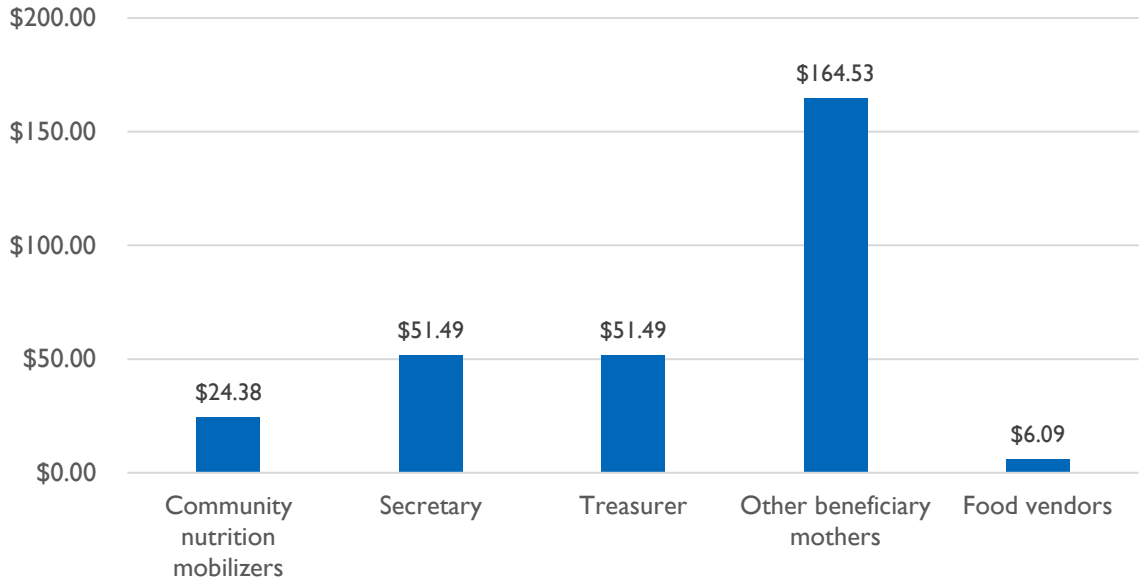


Figure 16 provides a breakdown of the costs included in the total societal costs summarized in table 16. Costs for CNMs, secretaries, treasurers, and other beneficiary mothers were calculated separately, because they all have slightly different roles and, therefore, opportunity costs for participation in the Porridge Mum groups. In the AAH Porridge Mum model, CNMs are volunteers and are only paid a small

stipend and they are, therefore, included in societal cost calculations. Opportunity costs for food vendors are also included in the societal cost calculations.

Figure 16. Societal Costs by Volunteer Type (Per Group), AAH



Total program costs per Porridge Mum group

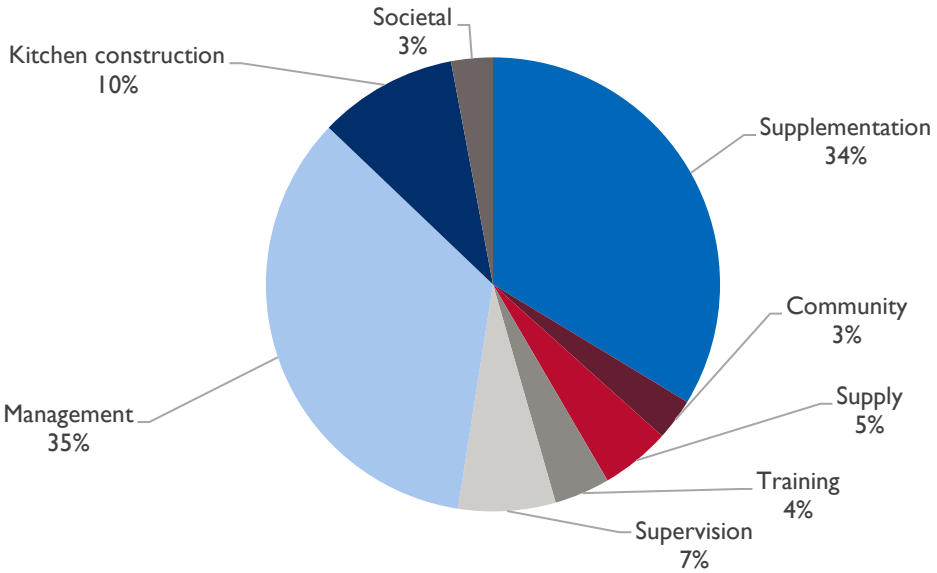
Table 17 and figure 17 summarize the total institutional and societal costs per AAH Porridge Mum group and the percent of total institutional and societal costs by cost type per Porridge Mum group. Annex 9 presents a more detailed breakdown of total institutional and societal costs per group, by cost category.

Table 17. Total Institutional and Societal Costs, AAH Porridge Mum per Group, Seven-Month Cycle

Cost Category	Cost by Category (U.S.$)
Institutional Costs (AAH)	
Supplementation	4,027.66
Community	321.56
Supply	645.26
Training	414.48
Supervision	821.99
Management	4,093.09
Kitchen construction	1,178.62
Societal Costs	

Cost Category	Cost by Category (U.S.$)
Societal	297.98
TOTAL	**11,800.65**

Figure 17. Total Institutional and Societal Costs per Porridge Mum Group, 7-month cycle, AAH (%)



While table 17 and figure 17 summarize the total institutional and societal costs of Porridge Mum per group, table 18 and figure 18 illustrate the direct costs for each of AAH's Porridge Mum groups (excluding shared management costs of the program). Table 18 summarizes the direct costs for each of the Porridge Mum groups (excluding shared management costs of the program) and figure 18 shows the percent of total direct costs by cost type per Porridge Mum group. The excluded shared costs include program management, supervision, training, community outreach, and shared indirect costs.

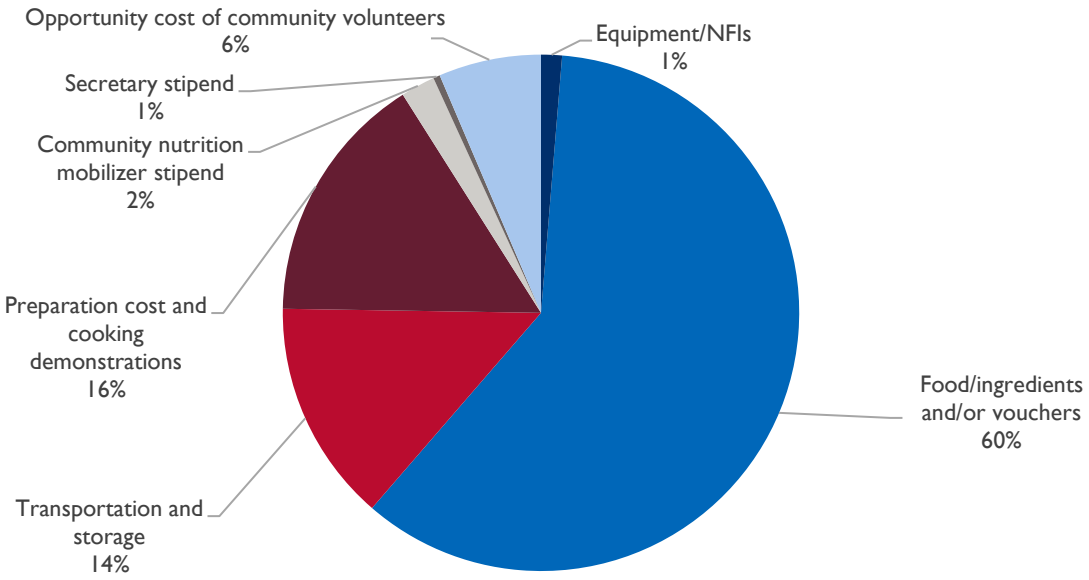
Table 18. Direct Costs per AAH Porridge Mum Group (U.S.$)[8]

Cost Type	Total Direct Costs (U.S.$)
Institutional Costs (AAH)	
Equipment/NFIs per group (gifted to secretaries)	60.65
Food/ingredients (voucher)	2,788.22
Transportation and storage	645.26
Preparation cost (grinding, transport, firewood and water) and cooking demonstrations	731.81
CNM stipends	99.86

[8] AAH provided some of the direct costs in table 18 during interviews and data separate from their accounting records.

Cost Type	Total Direct Costs (U.S.$)
Secretary stipends	19.50
Societal Costs	
Opportunity cost of community volunteers (CNMs, secretaries/treasurers, and vendors)	297.98
TOTAL	**4,643.28**

Figure 18. Direct Costs per Porridge Mum Group, 7-month cycle, AAH (%)



Discussion

Despite the fact that, globally, more children suffer from moderate wasting, its management has not received the same level of attention or priority, due in part to moderate wasting's lower risk of mortality compared to severe wasting and because of the outsized caseload of moderately wasted children. The results from this costing study provide needed evidence to assist local implementers and stakeholders with program planning and provide valuable information to assess the scalability and replicability of the Tom Brown and Porridge Mum approaches in Nigeria and also adds to the global evidence base on the costs of approaches to manage moderate wasting. This section includes an overview of the total costs and cost per child/beneficiary results across programs, discusses and synthesizes some of the differences in cost drivers for each of the studied approaches, and provides insights into their implications for overall cost and future scale-up.

Overview of Results

Table 19 summarizes the key results for each implementing partner.

Table 19. Overview of Results by Implementing Partner

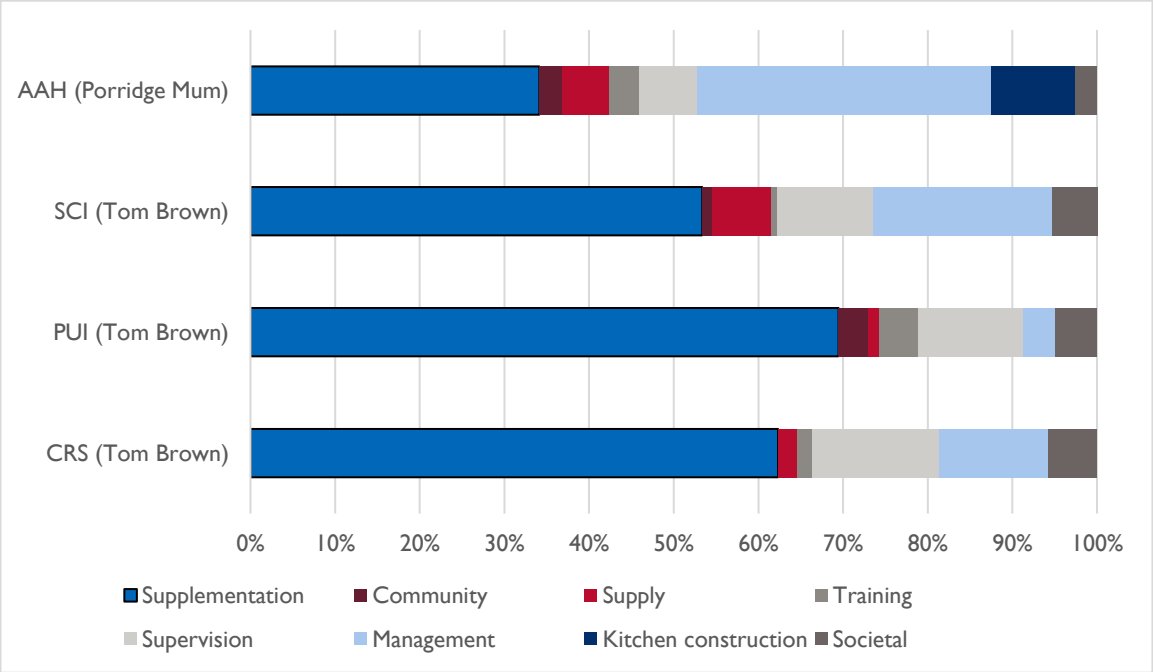
Program	CRS Tom Brown	PUI Tom Brown	SCI Tom Brown	AAH Porridge Mum
Institutional cost	U.S.$2,240,750.12 (94%)	U.S.$282,793.70 (95%)	U.S.$1,578,164.92 (95%)	U.S.$770,678.31 (97%)
Societal costs	U.S.$134,979.49 (6%)	U.S.$14,716.00 (5%)	U.S.$88,558.40 (5%)	U.S.$19,964.95 (3%)
Total cost	U.S.$2,375,729.61	U.S.$297,509.70	U.S.$1,666,723.32	U.S.$790,643.26
Time period	23 months *June 2021–April 2023*	30 months *January 2021–June 2023*	23 months *June 2021–April 2023*	7 months *November 2022–May 2023*
Total no. children/ beneficiaries enrolled	12,890	1,920	3,376	1,872
Total cost per child/beneficiary enrolled	U.S.$184.31	U.S.$154.95	U.S.$493.70	U.S.$422.35
Monthly supplementation cost per beneficiary	U.S.$8.01	U.S.$5.17	U.S.$21.47	U.S.$60.34

Table 20 summarizes the total institutional and societal costs for each implementing partner and figure 19 illustrates the difference between the percent of total cost per cost category across partners.

Table 20. Total Institutional and Societal Program Expenditures by Cost Category (U.S.$)

Cost Category	CRS	PUI	SCI	AAH
Institutional Costs				
Supplementation	1,481,004.86	206,718.50	889,744.62	269,852.96
Community	83.61	10,360.42	18,533.62	21,544.77
Supply	52,947.93	3,915.42	117,396.61	43,232.46
Training	42,984.66	13,848.35	10,797.72	27,770.43
Supervision	355,117.54	36,625.84	190,847.23	55,073.41
Management	308,611.52	11,324.70	350,845.13	274,236.78
Kitchen construction	-	-	-	78,967.50
Societal Costs				
Societal	134,979.49	14,716.00	88,558.40	19,964.95
TOTAL	**2,375,729.61**	**297,509.70**	**1,666,723.32**	**790,643.26**

Figure 19. Total Institutional and Societal Program Expenditures by Cost Category (%)



Interpretation of Results

Differences in Cost per Child/Beneficiary Enrolled

As illustrated in table 19, there are clear differences in the cost per child/beneficiary across the Tom Brown and Porridge Mum approaches. However, a lower unit cost (cost per child or beneficiary) does not automatically mean a more cost efficient or better value-for-money program model. According to our analysis these differences in unit costs are based on missing operating costs for one of the programs, the time period of the analysis and associated implementation period, and certain program features. Each aspect is explained in further detail below.

Missing Operating Costs

While the PUI cost data includes non-direct Tom Brown staff resources—including finance, logistics, and MEAL staff—other operating costs attributable to the program—including office costs in Borno and at the national level—were unavailable and were not assessed. This resulted in a lower cost per child enrolled when compared to the other programs, despite the lower number of children enrolled (1,920 children enrolled) and likely underestimates the actual total cost of the program. This is evident as 69 percent of the PUI costs are direct supplementation costs while only 4 percent are management costs. These operating costs have been included for the other two Tom Brown programs (SCI and CRS) and for AAH's Porridge Mum program. Figure 19 illustrates the difference between cost categories across partners, including the difference between the treatment and management costs of the other three partners.

Period of Implementation/Analysis

According to the results, the Porridge Mum approach seems to be more resource intensive than Tom Brown and results in a higher cost per beneficiary enrolled. However, given the shorter overall implementation time frame—only seven months compared to several years for the Tom Brown partners— there were likely some investments in capital costs and staff capacities that did not have a

chance to average out (or depreciate) during this shorter implementation period. With a longer period of implementation at-scale, the cost per beneficiary enrolled may be reduced.

Given the differences in time period of implementation, we also calculated an annualized cost to illustrate a more comparable total cost figure (table 21).

Table 21. Total and Annualized Cost by Implementing Partner (U.S.$)

Program	CRS Tom Brown	PUI Tom Brown	SCI Tom Brown	AAH Porridge Mum
Total cost	2,375,729.61	297,509.70	1,666,723.32	790,643.26
Time period	23 months *June 2021–April 2023*	30 months *January 2021–June 2023*	23 months *June 2021–April 2023*	7 months *November 2022–May 2023*
Annualized total cost	1,239,511.10	119,003.88	869,594.78	1,355,388.44
Monthly cost	103,292.59	9,916.99	72,466.23	112,949.04

Program Features

Coverage

One of the main contributing factors for the difference in the cost per child enrolled in the Tom Brown programs is the coverage of the programs (i.e., the more children enrolled, the lower the cost per child enrolled). As the developer of the Tom Brown approach, CRS reached the highest number of beneficiaries throughout the period captured in this analysis (12,890 children enrolled). However, all things equal, they also still have one of the lowest costs per child enrolled (see table 22). Despite having the lowest coverage of the Tom Brown programs, the PUI cost per child enrolled and the direct cost per group was the lowest of the three Tom Brown approaches. However, this is most likely an underestimation of operating costs attributable to the program (see section Missing Operating Costs).

Table 22. Cost per Beneficiary Enrolled by Implementing Partner (U.S.$)

Program	CRS Tom Brown	PUI Tom Brown	SCI Tom Brown	AAH Porridge Mum
Total cost	2,375,729.61	297,509.70	1,666,723.32	790,643.26
No. children/ beneficiaries enrolled	12,890	1,920	3,376	1,872
Unit cost (cost per beneficiary enrolled)	184.31	154.95	493.70	422.35

Local Foods and NFIs

When looking across both the Tom Brown and Porridge Mum programs, we found that implementers generally used the same ingredients to produce the Tom Brown flour. AAH's Porridge Mum approach

had multiple recipe options for staff to choose from, depending on seasonality of ingredients, including the Tom Brown recipe that CRS, SCI, and PUI also use. While there are some slight variations in the NFIs provided to group facilitators, the basic kit of materials is consistent across both Tom Brown and Porridge Mum programs. In each program, the facilitator is given the NFIs and is responsible for keeping them safe and in good condition for the entire program cycle. Although the basic kit was mostly the same across implementing partners, the cost of providing those NFIs per group varied by program: $138.91–$409.05 for Tom Brown and $60.65 for Porridge Mum.

Storage and Supply

While all four partners implemented the approaches in an emergency/rural setting, CRS also implements in a peri-urban setting in Maiduguri, thus direct Tom Brown program costs were assessed separately by area for CRS's approach due to the differences in implementation model by location (i.e., value vouchers were used in the peri-urban area only). All three Tom Brown program implementers (SCI, CRS, and PUI) operating in the emergency/rural area procure food ingredients in bulk and store the ingredients before delivering to the Tom Brown LM's houses once a week for flour production. SCI stores the ingredients centrally at the SCI Maiduguri office/warehouse. CRS stores the ingredients in satellite offices throughout the rural coverage area. To avert sudden breakdowns in the supply chain due to insecurity in Monguno, PUI stores the food ingredients in a central WFP storage facility in Monguno at no direct institutional cost to the program (these estimated storage costs have been in PUI's societal costs).

SCI's storage and transportation model is seemingly the main programmatic cost driver of their higher unit cost. This seems to be due to their decision to store items in their central Maiduguri warehouse instead of the other more decentralized option taken by CRS.
While AAH may not rely on satellite offices or central storage facilities for the food ingredients for Porridge Mums, there is still a relatively equivalent overall transportation and storage cost due to the intensive nature of the voucher-based model, its reliance on the procurement and logistics department, and storage and transportation costs for NFIs. This higher than expected cost of reliance on the procurement and logistics department is primarily because of tasks related to vendor prequalification and onboarding, quality assurance, and monthly market assessments. The Porridge Mum program has a larger number of vendors compared to the Tom Brown programs; Tom Brown programs have only conducted a maximum of one market assessment each.

Voucher/Cash Transfer Component

We also aimed to isolate the cost of any voucher/cash transfer component of the programs, because scale-up may be planned in non-emergency settings where these components may not be relevant. Given the structure of CRS' accounting database, we were unable to isolate the costs related to their voucher fees. We were, however, able to isolate the costs of the voucher fees made under Porridge Mum and have presented them as a separate cost category in table 18 and figure 18. The group secretaries and other beneficiary mothers purchase all food ingredients for Porridge Mums using the monthly vouchers they receive, so the costs are categorized as "Food/ingredients (vouchers)." The success of Porridge Mum, and any Tom Brown voucher component (e.g., CRS' peri-urban implementation) relies on an existing FSL infrastructure being in place. Without an existing FSL program, the feasibility of and scalability of Porridge Mum is reduced.

Both AAH for Porridge Mum and CRS for the peri-urban delivery of Tom Brown included a cash/voucher component and had a partnership with RedRose, a company working in the Nigerian humanitarian sector, which provides a system that allows nongovernmental organizations to register beneficiaries, rapidly mobilize cash, and provide real-time monitoring and evaluation reporting. Through this partnership, AAH and CRS pay percentage fees to RedRose for the value of each voucher redeemed via their platform.

Volunteer Cadres Stipends

All four programs used CNMs to implement their intervention at the community-level, primarily for active case finding, counseling of mothers, and supervision of the groups during the flour production process/cooking demonstrations. Based on the types of activities that programs expect CNMs to perform, the monthly wage model (similar to CRS and SCI) seems more appropriate as opposed to the payment of a small stipend for transportation costs (similar to PUI and AAH). Programs that rely on volunteer community-based workforces place those volunteers at the lowest level of program implementation with multiple layers of supervision and support. However, the CNMs, while considered volunteers, are actively supervising and supporting other community-based volunteers, including LMs.

In addition to the CNMs, SCI also uses volunteer FAs to conduct case finding and enrollment in the community. The three Tom Brown programs also used LMs as lead facilitators for the groups while AAH's Porridge Mum's program used secretaries and treasurers, which are similar to a LM, to facilitate their groups. The secretaries and treasurers purchase the food ingredients from the local food vendors, facilitate and supervise the cooking demonstration sessions, monitor monthly group cash and voucher allocations, and conduct limited counseling of Porridge Mum group members. In the peri-urban model, CRS also used Assistant Beneficiary Mothers to help LMs in their duties as they relate to the voucher component of the program.

All four programs provide their volunteer cadres with a monthly stipend to cover similar, routine expenses related to their role (i.e., transportation, water, firewood, and grinding of grains). For Tom Brown, the LM stipend provided by PUI is slightly lower and not intended to cover transportation costs. In contrast, the Porridge Mum secretary stipend provided by AAH is significantly higher and is intended to also cover the purchase of any fresh ingredients for the recipes that need to be purchased from other local food vendors to cook a meal that is consumed by the entire group. These differences in volunteer stipends had varying contributions to the costs of the Tom Brown and Porridge Mum costs per beneficiary.

While the PUI Tom Brown program has the highest volunteer stipend cost per group (U.S.$266.14), which includes the total of all volunteer stipends per group) the opportunity cost to community-based volunteers per group (U.S.$91.98) is the lowest of the four programs. Additionally, PUI pays a stipend to the MOH staff who conduct joint supportive supervision, eliminating their inclusion in the opportunity cost estimation.

Societal Costs

From our analysis, we can see that opportunity (societal) costs of the interventions are substantial. The results highlight that it is critical to include and consider the opportunity costs of volunteer community-based workers and food vendors in the costs, which are essential to scalability of the interventions. Without this inclusion, partners risk underestimating the costs of their programs, the implications of community-level service delivery, and household participation.

While those partners using the cash/voucher model, which rely on LMs or other beneficiary mothers to purchase the food ingredients for the groups, have identified benefits and efficiencies in the model over consolidated program procurement and storage of ingredients, the model places a heavier opportunity cost on the community (food vendors, community workers, and beneficiaries) that should be considered. AAH's Porridge Mum approach has the highest opportunity cost (U.S.$297.98) per group.

Comparing Costs of Local Food-Based Approaches to TSFP

Table 23 shows an overview of the cost per child/beneficiary of the Tom Brown and Porridge Mum approaches alongside other costing studies for TSFP. It is important to interpret these figures with caution, as the implementation contexts and costing methodologies used are different. To arrive at a true total cost of the program, our methodology aimed to be very comprehensive in our inclusion of both institutional and societal costs. The costing studies for Sierra Leone and Indonesia also include

some societal costs, whereas the study from Mali only includes institutional costs. All costs are adjusted to 2023 dollars. Two of the Tom Brown programs (CRS and PUI) had a cost per beneficiary in line with, and slightly higher than, unit costs from analyses of TSFP programs (Griswold et al., 2021; Isanaka et al., 2019). The SCI Tom Brown program and the Porridge Mum program yielded a unit cost that is more than double those figures, and closer to daily/weekly biscuit supplementation programs in Indonesia (Purwestri et al., 2012).

Although we present it alongside programs designed to specifically address moderate wasting management, it is important to remember that Porridge Mum is not designed as a program to manage moderate wasting and, therefore, is not directly comparable to the other programs. Porridge Mum also provides services to PLW and has a much broader set of intended outcomes, potentially justifying its higher per beneficiary cost because it is preventative in nature. Additionally, a cost efficiency and effectiveness study that examines the cost of TSFP delivery in North East Nigeria is the only way to truly compare across approaches.

Table 23. Summary of Unit Costs across Approaches

	TSFP Sierra Leone	TSFP Mali	TSFP Locally Produced Biscuits Indonesia	Tom Brown Nigeria	Porridge Mum Nigeria
Cost per beneficiary (adjusted to 2023 dollars)	$101.04–$105.30	$126.41–$128.86	$446.79 - $560.3	$154.95–$493.70	$422.35
Inclusion of societal costs	Limited	No	Yes	Yes	Yes
Summary of included costs	Food product, clinic activities, admin and management costs including personnel, capital costs, logistical support, and limited societal costs.	Supplementary food, program personnel, medical supplies and materials, infrastructure, and logistical support.	Food and NFIs, personnel, institutional costs, limited logistical support, societal costs.	Institutional and societal costs as outlined in the methods section.	Institutional and societal costs as outlined in the methods section.

Sources: Griswold 2021; Isanaka 2019; Purwestri 2012

Conclusions and Key Considerations for Scale-Up

In areas where coverage of TSFP for supplementation of moderate wasting is limited, the Tom Brown and Porridge Mum approaches may be considered as alternative approaches to manage the moderate wasting caseload. This cost-efficiency analysis has highlighted several cost-related factors to consider, including technical considerations, when determining which approach, if any, is appropriate for the context.

Implementation Context

These results are specific to the implementation context in North East Nigeria, which is an ongoing emergency and food insecure context. This context predicates certain implementation decisions that, in turn, have cost implications. For example, all programs provide food items to program participants, either in-kind or facilitate their purchase using cash or vouchers. When looking at an individual Tom Brown or Porridge Mum group, these costs account for between 21 and 42 percent of per group costs for Tom Brown and 60 percent of per group costs for Porridge Mum. If a context were more food secure and a different model was used (e.g., mothers were taught to produce the flour/recipes but could procure the food inputs with their own resources) the cost implications would differ.

Potential Coverage and Scale

The recently released WHO Guideline on the Prevention and Management of Wasting and Nutritional Oedema (Acute Malnutrition) in Infants and Children Under 5 Years provides updated guidance on the management of moderate wasting in children under five. It emphasizes the use of nutrient-dense foods, inclusive of locally available foods that are typically consumed by households, to support their recovery. The guidance also identifies a set of risk factors that place moderately wasted children at higher risk and recommends that these children be prioritized to receive SFFs for management over local foods. Children who do not meet one or more of these risk factors are able to be supplemented with locally available foods (WHO 2023). This means there is great potential to scale-up programs such as Tom Brown and Porridge Mum as soon as countries, including Nigeria, begin to adapt their programs to manage and treat wasting to this new guidance. This costing study in Nigeria is an important step toward building the evidence base on the overall effectiveness (in terms of the impact supplementation has on nutritional status) and cost effectiveness of these programs in different contexts to reach consensus in the nutrition community on when local food-based approaches are considered acceptable and non-inferior alternatives to traditional TSFP approaches.

As illustrated by our analysis of Porridge Mum, the shorter implementation period, which did not allow for a similar depreciation of initial program start-up investments (e.g., kitchen construction and staff capacity), has contributed to its higher per beneficiary cost in this analysis, whereas CRS's longer implementation period and higher level of coverage contributed to a lower cost per child. The same is true of PUI's lower Tom Brown coverage rate compared to CRS and SCI's' coverage, resulting in a higher unit cost.

When considering scaling up or introducing these approaches to a new area (known as replication), it is important to consider factors that may impact potential coverage, such as moderate wasting prevalence and population concentration. In some ways, Tom Brown and Porridge Mum have higher up-front investments than a TSFP because the approach needs to be established in each community, where a TSFP is linked to an already-established facility that covers several communities. However, as noted earlier, there are also tradeoffs in opportunity costs to the caregivers in terms of time required to produce the flour/recipes versus traveling to the clinic to seek care. It is also important to consider the potentially higher opportunity cost of traveling to a health facility only to find that treatment is not

available due to low coverage or a break in service delivery due to supply chain issues. A community-based approach may be more appropriate for areas where traveling to a facility poses security concerns. However, a population that is prone to displacement may not be well suited to an approach anchored in a community. Questions around potential coverage and scale must be considered carefully with these contextual considerations.

Societal Costs

Although as a proportion of total program costs societal costs are quite small, ranging from 3 to 6 percent. However, these costs as opportunity costs to an individual may be quite significant. To illustrate this, the monthly opportunity cost per beneficiary mother is displayed in table 24. When compared to the minimum wage in Nigeria (30,000 Naira; $39.00), the beneficiary mothers are conducting activities that require a level of effort that is valued at more than 10 percent of the monthly minimum wage in all programs except for PUI, which is only slightly below. Our analysis also suggests that there are higher opportunity costs when cash/vouchers are used. One of the factors driving this higher cost is the additional time that volunteers (e.g., LMs, assistant beneficiary mothers, secretaries) must spend to purchase food from the vendors. It is also important to note that our analysis did not include additional opportunity costs to beneficiary mothers in Porridge Mum groups to purchase foods using their individual vouchers or to prepare new or additional meals during the week.

Table 24. Opportunity Cost per Beneficiary Mother by Implementing Partner

Program	CRS Tom Brown	PUI Tom Brown	SCI Tom Brown	AAH Porridge Mum
Opportunity cost per month (U.S.$)	U.S.$7.68	U.S.$2.92	U.S.$8.78	U.S.$4.39
Opportunity cost per month (Naira)	5,906	2,247	6,750	3,375

In-Kind Food Distributions versus Cash and Vouchers

Our analysis found that the use of cash and/or vouchers is a significant driver of societal costs. It also represents a potentially significant institutional cost if an existing FSL program is not already in place. Even with an existing FSL program in place, the reliance on the existing FSL structure is not without cost. However, the cash and/or voucher model of Tom Brown and Porridge Mum offer additional opportunities for sustainability. Because the grains are sourced from local food vendors, vendors within the community are sensitized through nutritional messaging from the program and exposed to the grains and food ingredients that offer high nutritional value. This increases the likelihood that the vendors in the community will continue to carry these ingredients, even after the end of the program, so beneficiaries can continue to replicate the recipes. This has already been seen in the community served by CRS.

Areas for Additional Research and Learning

Evidence on the use of local foods for the management of moderate wasting is limited, for both their general programmatic effectiveness as well as their cost effectiveness. Of the 10 peer reviewed studies we identified that were related to using local foods to manage moderate wasting, five reported on recovery rates and all met Sphere standards for recovery. Some studies also compared local food-based

recipes and rations to other commercially produced products like CSB+, and were found to be non-inferior (USAID Advancing Nutrition 2023). Having a more robust evidence base for effectiveness is important as it enables costing studies to also look at cost effectiveness, rather than only cost efficiency, as was done for this particular study in Nigeria. As nutrition stakeholders begin to put into practice the updated WHO guidance, especially related to the management of lower-risk children with moderate wasting, additional costing studies that include primary data collection on approach effectiveness should be conducted to help further inform decisions on which approaches (e.g., Tom Brown, Porridge Mum, or TSFP) is the most appropriate, based on tradeoffs between contextual appropriateness, effectiveness, and cost at scale. Additionally, research should ensure the use of consistent methods, where possible, and the use of standard definitions of outputs and outcomes indicators, as well as cost categories to increase uptake and comparability of results across the sector. Guidelines and tools for such research have been reviewed, recommended, and endorsed in 2020 and 2023 (Chui et al. 2020; Chui and Trenouth 2023).

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Annex 1: Data Collection Tool

MAM Treatment with Locally Available Food-Based Approaches (2023)

Please read the consent form and ask for the respondent's approval before starting the interview.

1. Name of Interviewer	
2. Date of Interview (MM/DD/YYYY)	
3. Questionnaire Number	
4. Respondent ID	
5. Partner Organization	
6. Community Name/Code	
7. Name of Respondent	
8. Title of Respondent	

Questionnaire is mainly directed toward program staff (with the potential to include some food vendors if logistically feasible).

Complete the answer(s) in the appropriate section below, do not duplicate.

Program Staff Costs Questions	
9. Total number of staff that have contributed to the implementation of the program (procure a list for additional probing).	
10. Which staff work on the program 100%?	
11. Probe for additional details of role of specific staff who may require time allocation interviews and for those who may only work a proportion of their time on the program.	
12. Probe additional questions to understand the cost data outputs and how to tie staff time to cost categories (i.e., training, supervision, technical assistance, etc.).	

13. What is the role of the government in the program? Do government ministries provide any resources necessary for implementation? If so, what are these? i.e.: 1. staff time 2. direct inputs 3. indirect contributions 4. those costs that need to be considered for scale-up?	
14. Where can we see food storage costs in the cost data?	
14.b If food storage costs are "off-budget" (or otherwise not found in the program cost data), what resources are required to store the food? **(NB:** Collect information here about building rent, size of building, space used for food storage (%), cost of guards, etc.).	

Beneficiary time and resources	
15. List all activities beneficiaries participated in during the preparation of LBF (Tom Brown or Porridge Mums). For example: 1. Washing food 2. Husking 3. Grinding and mixing 4. Collecting clean water 5. Counseling 6. Any others?	
16. List time spent by beneficiaries for each activity in Q9.	
17a. What percentage of beneficiaries pay to have grinding done versus those who do the grinding themselves?	

17b. What is the cost of grinding if it is done by the beneficiaries themselves?	
17c. What is the cost of grinding if it was paid for with cash by beneficiaries?	
18. How much firewood is used per week, or what is the cost of electricity used per week in cooking LBF (local currency)?	
19. Time spent by beneficiary in fetching firewood per week.	

Kitchen provision and construction	*Kitchen construction questions are relevant for Porridge Mums partners*
20a. What is the total cost of the kitchen construction?	
20b. For Tom Brown partners, was any kitchen adaptation/construction done to the lead mothers' homes (including equipment)? If yes, please list and describe the associated costs.	

21. How much or percentage of the kitchen cost was paid/contributed by local communities?	
22. List all the resources that were used for the construction of kitchen. How many of these were paid/contributed by the community versus a partner organization?	
23. List all activities performed by local community members and groups constructing kitchen for preparation of LBF.	
24. How much time was spent on each activity listed Q23 *(List those involved, and the # of days/hours spent).*	
25. What is the value of the resources that were provided by the community *(include the value of resources listed in Q22 and the value of any community time donated)?*	

Local Food Vendor Time and Resources	
26. What type of food vendor is used in the program?	
27. Are food vendors paid service fees or other costs? If so, please list and describe these and how frequently are they paid.	
28. How much time is spent (in minutes) by food vendors in selling locally available foods and ingredients? Activities may include processing voucher requests, preparing payment requests, and other transactions.	
29. How many times do food vendors vend to beneficiaries per week?	

Local Foods Preparation	
30. List all ingredients in units (i.e., metric tons, bags, pans, as appropriate) used to prepare one batch of the selected LBF.	
31. List the cost for each ingredient listed in Q30 for preparing LBF (in local currency).	
32. Was the local food prepared by beneficiaries or by the CNM/lead mothers?	
33. How many volunteers helped in implement LBF for treatment of MAM?	
34. What type of volunteers are involved in producing the LBF *(CNMs, Lead Mothers, any others)?*	
35. What is the educational background of CNM/LMs? Other volunteers?	

36. List all activities volunteers provided in supporting the implementation of LBF?

For example:

1. Training of beneficiaries

2. Kitchen construction

3. Transportation of ingredients

4. Food preparation (e.g., Tom Brown)

5. Transportation of finished LBF to beneficiaries

6. Any others?

	CNM	LM	…		
Training BNFs					
Kitchen construction					
Transport ingredients					
Food preparation					
Transport LBF					
…					

37. List time spent by volunteers for each activity in Q36 in support of implementing LPF *(list those involved, and the # of days/hours spent).*

	CNM	LM	…		
Training BNFs					
Kitchen construction					
Transport ingredients					
Food preparation					
Transport LBF					
…					

CNM and LM Support	
38. List all activities CNMs/lead mothers performed specifically in the food preparation of LBF (Tom Brown or Porridge Mums) and the time spent by CNMS/LMs for each activity. *(List the # of days/hours spent per batch.)* For example: 1. Washing food 2. Husking 3. Grinding and mixing 4. Collecting clean water 5. Counseling	
39. Do CNMs receive an incentive for their work on the program? If yes, what is the incentive?	

	CNM	LM	…
Washing food			
Husking			
Grinding and mixing			
Collecting clean water			
Counseling			
…			

40. Do CNMs incur any out-of-pocket costs (i.e., for transportation or anything else)? If so, how much and what was the frequency?	
41. Do LMs receive an incentive for their work on the program? If yes, what is the incentive?	
42. Do LMs incur any out-of-pocket costs (i.e., for transportation or anything else)? If so, how much and what was the frequency?	
43. What was the **c**ost of grinding if it was paid for by CNM/LM?	
44. What was the cost of electricity or firewood use per week in cooking LBF (local currency) if paid for by CNM/LM?	
45. What was the time spent by CNM/LM in fetching firewood per week?	

Annex 2: Detailed Breakdown of CRS Tom Brown Expenditures by Cost Category (U.S.$)

Costs by Cost Category	CRS Costs	JDPC & NEYIF Costs	Total Cost	Percent of Sub total/ Total
Institutional Costs (CRS and partners)				
Supplementation				
Direct Tom Brown Costs (e.g., food and equipment for groups)	372,060.16	779,802.78	1,151,862.94	78%
Allowances and incentives for community-based volunteers	319,347.48	-	319,347.48	22%
Case finding	151.20	-	151.20	0.01%
HR	9,643.25	-	9,643.25	0.65%
Sub-total Supplementation			*1,481,004.86*	*62%*
Community				
Communications (printed materials, flyers, etc.)	83.61	-	83.61	100%
Sub-total Community			*83.61*	*0.004%*
Supply				
Storage	34,954.91	-	34,954.91	66%
Transport	17,993.02	-	17,993.02	34%
Sub-total Supply			*52,947.93*	*2%*

Costs by Cost Category	CRS Costs	JDPC & NEYIF Costs	Total Cost	Percent of Sub total/ Total
Training				
HR	14,944.81	-	14,944.81	35%
Other costs	28,039.85	-	28,039.85	65%
Sub-total Training			*42,984.66*	*2%*
Supervision				
HR	352,890.74	-	352,890.74	99%
Other costs	2,226.80	-	2,226.80	1%
Sub-total Supervision			*355,117.54*	*14.9%*
Management				
Monitoring and Evaluation	1,076.59	-	1,076.59	0.3%
Programme management	2,125.85	-	2,125.85	1%
Shared indirect costs (e.g., office costs, transport)	231,439.67	-	231,439.67	75%
HR	73,969.41	-	73,969.41	24%
Sub-total Management			*308,611.52*	*13%*
Societal Costs				
Opportunity cost of community volunteers (LMs, CNMs, and vendors) *weighted average from both CRS models	134,979.49	-	134,979.49	100%
Sub-total Societal Costs			*134,979.49*	*5.7%*

Costs by Cost Category	CRS Costs	JDPC & NEYIF Costs	Total Cost	Percent of Sub total/ Total
TOTAL	**1,595,926.83**	**779,802.78**	**2,375,729.61**	**100%**

Annex 3: Detailed Breakdown of CRS Tom Brown Expenditures by Cost Category Per Group, Eight-Week Cycle (U.S.$)

Costs by Cost Category	CRS Costs	JDPC & NEYIF Costs	Societal Costs	Total Cost	Percent of Sub total/ Total
Institutional Costs (CRS and partners)					
Supplementation					
Direct Tom Brown costs (e.g., food and equipment for groups)	626.36	1,312.80	-	1,939.16	78%
Allowances and incentives for community-based volunteers	537.62	-	-	537.62	22%
Case finding	0.25	-	-	0.25	0.01%
HR	16.23	-	-	16.23	1%
Sub-total Supplementation				*2,493.27*	*62%*
Community					
Communications (printed materials, flyers, etc.)	0.14	-	-	0.14	100%
Sub-total Community				*0.14*	*0.004%*
Supply					
Storage	58.85	-	-	58.85	66%
Transport	30.29	-	-	30.29	34%

Costs by Cost Category	CRS Costs	JDPC & NEYIF Costs	Societal Costs	Total Cost	Percent of Sub total/ Total
Sub-total Supply				*89.14*	*2%*
Training					
HR	25.16	-	-	25.16	35%
Other costs	47.21	-	-	47.21	65%
Sub-total Training				*72.36*	*2%*
Supervision					
HR	594.09	-	-	594.09	99%
Other costs	3.75	-	-	3.75	1%
Sub-total Supervision				*597.84*	*14.9%*
Management					
Monitoring and Evaluation	1.81	-	-	1.81	0.3%
Program management	3.58	-	-	3.58	0.7%
Shared indirect costs (e.g., office costs, transport)	389.63	-	-	389.63	75%
HR	124.53	-	-	124.53	24%
Sub-total Management				*519.55*	*13%*
Societal Costs					
Opportunity cost of community volunteers (LMs, CNMs, and vendors) *weighted average from both CRS models	-	-	227.24	227.24	100%

Costs by Cost Category	CRS Costs	JDPC & NEYIF Costs	Societal Costs	Total Cost	Percent of Sub total/ Total
Sub-total Societal Costs				*227.24*	*6%*
TOTAL	**2,459.51**	**1,312.80**	**227.24**	**3,999.54**	**100%**

Annex 4: Detailed Breakdown of PUI Tom Brown Expenditures by Cost Category (U.S.$)

Costs by Category	Total Costs*	Percent of Sub total/Total Costs
Institutional Costs (PUI)		
Supplementation		
Direct Tom Brown Costs (e.g., food and equipment for groups)	164,136.44	79%
Allowances and incentives for community-based volunteers	42,582.06	21%
Sub-total Supplementation	*206,718.50*	*69%*
Community		
HR	10,360.42	100%
Sub-total Community	*10,360.42*	*3%*
Supply		
HR	3,915.89	100%
Sub-total Supply	*3,915.89*	*1%*
Training		
Other costs	13,848.35	100%
Sub-total Training	*13,848.35*	*5%*
Supervision		

Costs by Category	Total Costs*	Percent of Sub total/Total Costs
HR	36,625.84	100%
Sub-total Supervision	*36,625.84*	*12%*
Management		
HR	7,649.30	68%
M&E	3,675.40	32%
Sub-total Management	*11,324.70*	*4%*
Societal Costs		
Opportunity cost of community volunteers (LMs, CNMs, and vendors) and donated storage space	14,716.00	100%
Sub-total Societal Costs	*14,716.00*	*5%*
TOTAL	**297,509.70**	**100%**

*PUI does not work with a partner organization; therefore, PUI pays all costs.

Annex 5: Detailed Breakdown of PUI Tom Brown Expenditures by Cost Category Per Group, Eight-Week Cycle (U.S.$)

Costs by Category	Total Costs*	Percent of Sub total/Total Costs
Institutional Costs (PUI)		
Supplementation		
Direct Tom Brown Costs (e.g., food and equipment for groups)	1,025.85	79%
Allowances and incentives for community-based volunteers	266.14	21%
Sub-total Supplementation	*1,291.99*	*69%*
Community		
HR	64.75	100%
Sub-total Community	*64.75*	*3%*
Supply		
HR	24.47	100%
Sub-total Supply	*24.47*	*1%*
Training		
Other costs	86.55	100%
Sub-total Training	*86.55*	*5%*

Costs by Category	Total Costs*	Percent of Sub total/Total Costs
Supervision		
HR	228.91	100%
Sub-total Supervision	*228.91*	*12%*
Management		
HR	47.81	68%
Monitoring and Evaluation	22.97	32%
Sub-total Management	*70.78*	*4%*
Societal Costs		
Opportunity cost of community volunteers (LMs, CNMs, and vendors) and donated storage space	91.98	100%
Sub-total Societal Costs	*91.98*	*5%*
TOTAL	**1,859.44**	**100%**

*PUI does not work with a partner organization; therefore, PUI pays all costs.

Annex 6: Detailed Breakdown of SCI Tom Brown Expenditures by Cost Category (U.S.$)

Costs by Cost Category	SCI Costs	Green Code Costs	Total Cost	Percent of Sub total/ Total
Institutional Costs (SCI and partner)				
Supplementation				
Direct Tom Brown costs (e.g., food and equipment for groups)	11,766.52	492,677.42	504,443.94	56.7%
Allowances and incentives for community-based volunteers	-	325,574.98	325,574.98	36.6%
Referrals	2,952.03	-	2,952.03	0.3%
HR	-	56,773.67	56,773.67	6.4%
Sub-total Supplementation			*889,744.62*	*53.4%*
Community				
HR	4,119.06	-	4,119.06	22%
Other costs	14,234.10	180.46	14,414.56	78%
Sub-total Community			*18,533.62*	*1.1%*
Supply				
Storage	-	3,340.66	3,340.66	3%
Transport	90.78	75,830.82	75,921.60	65%
HR	13,697.30	24,437.05	38,134.35	32%

Costs by Cost Category	SCI Costs	Green Code Costs	Total Cost	Percent of Sub total/ Total
Sub-total Supply			*117,396.61*	*7%*
Training				
Other costs	8,820.05	1,977.67	10,797.72	100%
Sub-total Training			*10,797.72*	*0.6%*
Supervision				
HR	174,240.51	14,970.51	189,211.02	99%
Government visits to the communities	261.51	1,374.70	1,636.21	1%
Sub-total Supervision			*190,847.23*	*11.5%*
Management				
Monitoring and Evaluation	28,580.33	1,015.63	29,595.96	8%
Shared indirect costs (e.g., office costs, transport)	151,877.84	-	151,877.84	43%
HR	83,793.48	59,315.94	143,109.42	41%
Other costs	-	26,261.91	26,261.91	7%
Sub-total Management			*350,845.13*	*21%*
Societal Costs				
Opportunity Cost of community volunteers (LMs, CNMs, FAs & vendors)	88,558.40	-	88,558.40	100%
Sub-total Societal Costs			*88,558.40*	*5.3%*

Costs by Cost Category	SCI Costs	Green Code Costs	Total Cost	Percent of Sub total/ Total
TOTAL	**582,991.91**	**1,083,731.41**	**1,666,723.32**	**100%**

Annex 7: Detailed Breakdown of SCI Tom Brown Expenditures by Cost Category Per Group, Ten-Week Cycle (U.S.$)

Costs by Cost Category	SCI Costs	Green Code Costs	Total Cost	Percent of Sub total/Total
Institutional Costs (SCI and partner)				
Supplementation				
Direct Tom Brown costs (e.g., food and equipment for groups)	37.35	1,564.06	1,601.41	56.7%
Allowances and incentives for community-based volunteers	-	1,033.57	1,033.57	36.6%
Referrals	9.37	-	9.37	0.3%
HR	-	180.23	180.23	6.4%
Sub-total Supplementation			*2,824.59*	*53.4%*
Community				
HR	13.08	-	13.08	22%
Other costs	45.19	0.57	45.76	78%
Sub-total Community			*58.84*	*1.1%*
Supply				
Storage	-	10.61	10.61	3%
Transport	0.29	240.73	241.02	65%

Costs by Cost Category	SCI Costs	Green Code Costs	Total Cost	Percent of Sub total/Total
HR	43.48	77.58	121.06	32%
Sub-total Supply			*372.69*	*7%*
Training				
Other costs	28	6.28	34.28	100%
Sub-total Training			*34.28*	*0.6%*
Supervision				
HR	553.14	47.53	600.67	99%
Government visits to the communities	0.83	4.36	5.19	1%
Sub-total Supervision			*605.86*	*11.5%*
Management				
M&E	90.73	3.22	93.96	8%
Shared indirect costs (e.g., office costs, transport)	482.15	-	482.15	43%
HR	266.01	188.30	454.32	41%
Other costs	-	83.37	83.37	7%
Sub-total Management			*1,113.79*	*21%*
Societal Costs				
Opportunity cost of community volunteers (LMs, CNMs, FAs, and vendors)	281.14	-	281.14	100%

Costs by Cost Category	SCI Costs	Green Code Costs	Total Cost	Percent of Sub total/Total
Sub-total Societal Costs			*$281.14*	*5.3%*
TOTAL	**1,850.77**	**3,440.42**	**5,2919.19**	**100%**

Annex 8: Detailed Breakdown of AAH Porridge Mum Expenditures by Cost Category (U.S.$)

Costs by Cost Category	Total Cost*	Percent of Sub total/Total
Institutional Costs (AAH)		
Supplementation		
Direct Porridge Mum costs (e.g., food and equipment for groups)	100,013.94	37.1%
Allowances and incentives for community-based volunteers	6,690.61	2.5%
Case finding	2,784.98	1%
Referrals	429.29	0.2%
Voucher fees	159,634.58	59.2%
HR	305.57	0.1%
Sub-total Supplementation	*269,852.96*	*34%*
Community		
Printed materials, flyers, etc.	17,297.48	80%
Other costs	4,247.29	20%
Sub-total Community	*21,544.77*	*3%*
Supply		
Storage	16,827.70	39%

Costs by Cost Category	Total Cost*	Percent of Sub total/Total
Transport	7,334.86	17%
HR	19,069.91	44%
Sub-total Supply	*43,232.46*	*5%*
Training		
HR	5,249.99	19%
Other costs	22,520.44	81%
Sub-total Training	*27,770.43*	*4%*
Supervision		
HR	53,429.15	97%
Government visits to the communities	1,644.26	3%
Sub-total Supervision	*55,073.41*	*7%*
Management		
Monitoring and Evaluation	31,639.63	12%
Shared indirect costs (e.g., office costs, transport)	115,362.64	42%
HR	114,264.43	42%
Program management	12,970.09	5%
Sub-total Management	*274,236.78*	*35%*
Kitchen Construction		

Costs by Cost Category	Total Cost*	Percent of Sub total/Total
Construction	78,967.50	100%
Sub-total Kitchen Construction	*78,967.50*	*10%*
Societal Costs		
Opportunity cost of community volunteers (LMs, CNMs, FAs, and vendors)	19,964.95	100%
Sub-total Societal Costs	*19,964.95*	*3%*
TOTAL	**790,643.26**	**100%**

*AAH does not work with a partner organization; therefore, AAH pays all costs.

Annex 9: Detailed Breakdown of AAH Porridge Mum Expenditures by Cost Category Per Group, Seven-month Cycle (U.S.$)

Costs by Category	Total Costs*	Percent of Sub total/Total Costs
Institutional Costs (AAH)		
Supplementation		
Direct Porridge Mum costs (e.g., food and equipment for groups)	1,492.75	37.1%
Allowances and incentives for community-based volunteers	99.86	2.5%
Case finding	41.57	1%
Referrals	6.32	0.2%
Voucher fees	2,382.61	59.2%
HR	4.56	0.1%
Sub-total Supplementation	*4,027.66*	*34%*
Community		
Printed materials, flyers, etc.	258.17	80%
Other costs	63.39	20%
Sub-total Community	*321.56*	*3%*
Supply		

Costs by Category	Total Costs*	Percent of Sub total/Total Costs
Storage	251.16	39%
Transport	109.48	17%
HR	284.63	44%
Sub-total Supply	*645.26*	*5%*
Training		
HR	78.36	19%
Other costs	336.13	81%
Sub-total Training	*414.48*	*4%*
Supervision		
HR	797.45	97%
Government visits to the communities	24.54	3%
Sub-total Supervision	*821.99*	*7%*
Management		
Monitoring and Evaluation	472.23	12%
Shared indirect costs (e.g., office costs, transport)	1,721.83	42%
HR	1,705.44	42%
Program management	193.58	5%
Sub-total Management	*4,093.09*	*35%*

Costs by Category	Total Costs*	Percent of Sub total/Total Costs
Kitchen Construction		
Kitchen Construction	1,178.62	100%
Sub-total Kitchen Construction	*1,178.62*	*10%*
Societal Costs		
Opportunity cost of community volunteers (LMs, CNMs, FAs, and vendors) and donated storage space	297.98	100%
Sub-total Societal Costs	*297.98*	*3%*
TOTAL	**11,800.65**	**100%**

*AAH does not work with a partner organization; therefore, AAH pays all costs.

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