



THE LAST MILE OF FOOD AID DISTRIBUTION: INSIGHTS GAINED THROUGH FAQR'S FIELD STUDIES IN MALAWI, BURKINA FASO, AND SIERRA LEONE

A Report from the Food Aid Quality Review

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ACRONYMS

BUBD	Best Used By Date
CFA	Communauté Financière d'Afrique
CSB	Corn Soy Blend
CSB+	Corn Soy Blend Plus
CSWB	Corn Soy Whey Blend
DC	Distribution Committee
DFSA	Development Food Security Activities
DHMT	District Health Management Team
FAQR	Food Aid Quality Review
FDP	Food Distribution Point
FFP	Food for Peace
FVO	Fortified Vegetable Oil
FY	Fiscal Year
IP	Implementing Partner
MAM	Moderate-Acute Malnutrition
MT	Metric Ton
M&E	Monitoring and Evaluation
PET	Polyethylene Terephthalate
PVO	Private Voluntary Organization
RUSF	Ready-to-Use Supplementary Foods
SBCC	Social Behavior Change Communication
SC+	Super Cereal Plus
UN	United Nations
US\$	U.S. Dollar
USAID	United States Agency for International Development
WFP	World Food Programme

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I. EXECUTIVE SUMMARY

In Fiscal Year (FY) 2017, through its food assistance programs, the United States Agency for International Development (USAID)/Office of Food For Peace (FFP) reached 70 million people in 53 countries as part of the global effort to fight hunger and malnutrition.¹ This included shipping over 1.4 million metric tons (MT) of food aid products from the United States to vulnerable populations across the globe. In these programs, the foods must go through a complex journey to reach end recipients. They are usually shipped by ocean freight and brought by truck to a main warehouse in the receiving country. This process takes several months, and even once the foods arrive in-country, significant challenges can arise before the foods reach the end recipients' homes.

Indeed, the “last mile,” defined as the section of the food aid supply chain between receipt of the foods by the implementing partner² and storage at the recipients' homes, is often a source of major bottlenecks for food aid stakeholders. The difficulties linked to environmental conditions, geography, and the available infrastructure and resources can negatively affect the efficiency and even the impact of food aid programs. Donors and decision-makers often lack contextually appropriate insights to understand some of these difficulties, and in-country organizations and volunteers must often find context-specific strategies to adapt to the difficulties they face. Last mile scenarios vary greatly among food aid programs, and there is no uniform solution to common problems. However, a better overall understanding of the last mile can help to improve the design, efficiency, and cost-effectiveness of food aid programs.

This report contributes to last mile knowledge-building by drawing on experience from the Food Aid Quality Review (FAQR) Project's field studies conducted on USAID/FFP Title II Development Food Security Activities (DFSA) in Southern Malawi and Northeastern Burkina Faso, as well as a Supplementary Feeding Program in Southern Sierra Leone. Through observations, interviews, and focus groups, the FAQR team collected feedback from food aid recipients, volunteers, and implementing partners on the challenges they face and strategies they have implemented to move foods through the last mile.

These stakeholders provided insights on the coordination and communication challenges posed by having multiple partners involved throughout the food aid supply chain up to and including the last mile. Stakeholders also discussed logistical and transport difficulties such as environmental conditions and limited local resources and infrastructure. These difficulties often introduce risks during the transport and storage stages, which are critical to ensuring that foods maintain their integrity until they reach the recipients.

In terms of distribution, both volunteers and recipients expressed that although local communities are very grateful to receive food aid, it does require them to dedicate significant time and resources to the programs. Discussions with food aid recipients also allowed the FAQR team to gain some insights on what happens to the foods once they reach the recipients' homes.

¹ USAID. June 4, 2018. *Food for Peace 2017 Annual Report*. Retrieved from <https://www.usaid.gov/documents/1866/food-peace-fiscal-year-2017-annual-report>.

² Implementing Partners are organizations that have been awarded grants and are in charge of carrying out and implementing food assistance programs in-country.

Finally, a breakdown of costs highlights the main contributors and, along with the information presented above, provides insight on possible areas of improvement that could lead to cost-effectiveness gains.

The main takeaways are summarized below.

1. Having several stakeholders involved in the last mile can increase the efficiency of a program by combining their strengths. However, to promote smooth operations, implementing partners should establish open and clearly defined communication channels to facilitate coordination and avoid confusion or delays, such as when the incorrect quantities of food aid commodities are sent to distribution sites due to lack of communication between distribution and warehousing staff. Responsibilities must also be well defined in advance to avoid conflicts and stalling of food distribution.

Action Item: When establishing partnerships at project startup, prioritize establishing communications channels and decision trees to guide project actions.

2. Standard protocols and funder requirements should ensure the well-being of beneficiaries and effectiveness of program implementation; however, when the necessity to adhere to standards negatively impacts program effectiveness, greater flexibility should be allowed. Every last mile scenario is unique, and some challenges cannot be eliminated (e.g., weather, lack of infrastructure, long distances), but with flexibility, implementing partners and local stakeholders can develop context-specific systems. Partners should be allowed to depart from standard protocols if doing so would increase efficiency and effectiveness of their programs. For example, a more nuanced competitive bidding process for transportation and storage that weighs quality as equal to cost-savings can result in overall efficiency and cost-effectiveness gains with greater benefit to recipients.

Action Item: Funders and implementing partners should agree on areas where standard protocols and contract requirements can be adapted to allow for more flexibility to adjust last mile resources to the local context.

3. Using distribution committees and other volunteers increases community involvement and facilitates communication with the recipients but implementing partners and funders should be conscious of the burden it represents. Volunteers frequently spend several days every month working for the program, which keeps them away from their fields, families, and other occupations. Volunteers should be recognized and compensated for their work. This would significantly improve working conditions and, consequently, improve their motivation and performance.

Action Item: Implementing partners should develop recognition and compensation structures for volunteers. Funders should support inclusion of these line items in program proposals and budgets.

4. Enrollment in a food aid program also requires a significant commitment from the recipients who cannot always follow the program's guidelines. There should be a greater emphasis on trying to understand the feasibility of programs' requirements, conditionalities, and recommendations from the recipients' perspective during the program design and implementation process.

Action Item: Implementing partners should consider strategies to elicit recipient feedback throughout the program life cycle, and funders should allow programs to be adjusted based on recipients' feedback.

The last mile may not be the largest contributor to the total cost of a food aid program. However, it can significantly impact the program's cost-effectiveness. Future efforts should be directed to collecting more reliable data to understand the details of last mile resource allocation and quantify the extent of potential cost-effectiveness gains resulting from greater last mile flexibility.

II. INTRODUCTION

Populations in need of food aid products often reside in difficult-to-reach places that lack consistent and reliable transportation and infrastructure. This can cause the end of the food aid supply chain to become a bottleneck for effective food aid programming, even if delivery of food to the main in-country warehouse has been undertaken efficiently and in a timely manner. The donor is typically responsible for organizing transport from the donor country to the recipient country, but the donor often loses oversight when the foods are handed over to the implementing partner. Understanding what happens during the “last mile,” or from the time the foods are received by the implementing partner to the time it is ready for consumption at the food aid recipient’s home, is critical to identifying potential problems that affect the ultimate cost-effectiveness of food aid interventions. The diagram presented in Annex I outlines the main steps in the typical journey of a food aid product and highlights the last mile as defined in this report.

The last mile concept is therefore relevant to activities involved in delivering food aid products to defined recipients. However, depending on the context, the last mile of the food aid supply chain can vary greatly. Food aid products might be stored at one in-country warehouse before being delivered to the end recipients; or the foods might be transferred through two or more warehouses with easier access to the distribution points. The foods might be donated to an implementing partner that delivers the foods to recipients; or the foods might be transferred from the receiving implementing partner to a local organization that is responsible for distribution to the recipients. The foods might be repackaged before being distributed; or the recipients might bring their own containers to collect their rations. Volunteers from the communities might help to manage distribution; local government representatives might be overseeing operations; or food aid distribution might build on an existing health program.

Clearly, there are as many last mile scenarios as there are food aid programs. However, a better understanding of the challenges that stakeholders face in the last mile and the systems put in place to address those challenges can help to improve the design of food aid programs moving forward.

This report presents some of the challenges encountered in the last mile by drawing on FAQR food assistance research in three settings: (1) USAID/FFP Title II DFSA in Southern Malawi, (2) DFSA in Northeastern Burkina Faso, and (3) WFP Supplementary Feeding Program in Southern Sierra Leone. The purpose is to contribute to the understanding of the last mile, which will eventually lead to the design of more efficient and impactful food aid programs.

III. METHOD & OBJECTIVES

FAQR conducted field research in three contexts – Southern Malawi, Northeastern Burkina Faso, and Southern Sierra Leone – from which information on the last mile of food aid distribution can be drawn. The studies are described in Annex 2. These three different contexts offered an opportunity to collect insights on logistics, transport, storage, commodity management, and distribution.

The information pertinent to the last mile was extracted from transcriptions of focus group discussions and interviews with implementing partners, volunteers, and food aid recipients as well as from site observations. The information sources are summarized in Table I. In addition, FAQR’s Field Project Director in Burkina Faso and Field Research Managers in Sierra Leone and Malawi provided additional comments and insights to help interpret the stakeholders’ and recipients’ feedback.

However, the last mile was not the main focus of these three studies and therefore data collection was not based on the objective of last mile analysis. In addition, for the purpose of this report, no formal qualitative data analysis was conducted. Rather, the FAQR team reviewed the interviews, focus groups, and observation transcriptions and reports. The key themes were highlighted, and illustrative examples were pulled out and incorporated in this report. In addition, cost data collected in Malawi and Burkina Faso were reviewed to identify the main contributors to last mile costs.³

Table I: Sources of Information		
Malawi	Burkina Faso	Sierra Leone
<ul style="list-style-type: none"> - Observations of commodity distribution - Interviews with Private Volunteer Organization (PVO) staff - Questionnaire for recipients 	<ul style="list-style-type: none"> - Last mile interviews with Implementing Partner (IP) staff - Focus groups with Distribution Committees (DCs) - Interviews with recipients - Focus groups with recipients 	<ul style="list-style-type: none"> - Focus groups with recipients - Interviews with Warehousing and Logistics (W&L) Partner staff
Insights from FAQR field staff		

The objectives of this report were to draw from FAQR’s experience to:

1. Provide insights to USAID/FFP and other donors on how the foods are handled once they arrive in-country
2. Highlight the challenges faced by implementing partners and recipients in the last mile
3. Identify future priorities to improve the cost-effectiveness of food aid programs

IV. LOGISTICS, TRANSPORT, AND OVERSIGHT

IV.a. Overview of the Last Mile in the Context of FAQR’s Field Studies

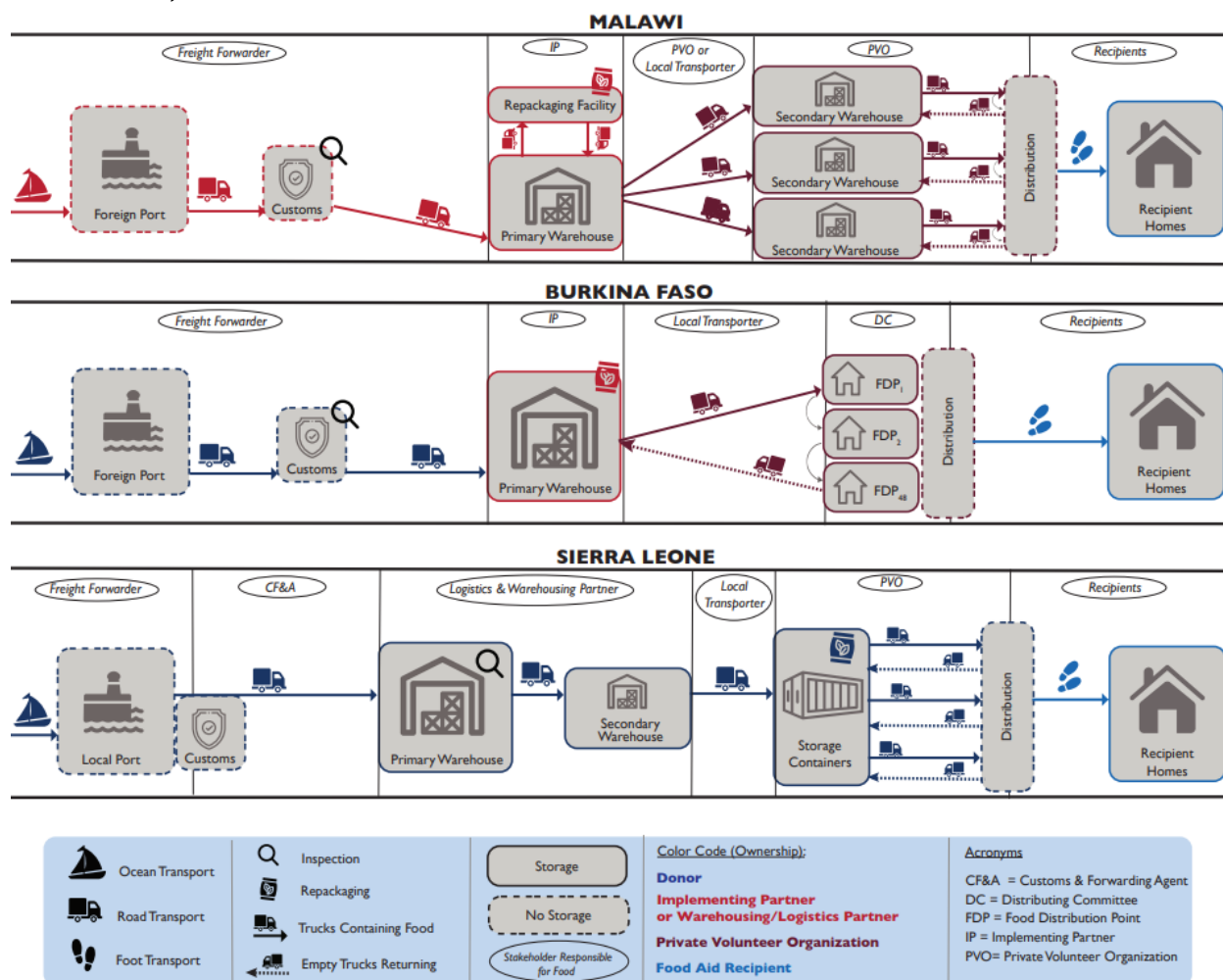
As defined in this report, the last mile can vary greatly depending on the local context, and it involves a series of steps that can differ in nature and execution. There are often several stakeholders involved, requiring great effort to streamline coordination. In all three examples

³ At the time of this report, the cost data from the study in Sierra Leone were not yet cleaned and analyzed, and therefore were not included.

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discussed here, the foods were received by a larger Implementing Partner (IP) or a Warehousing and Logistics (W&L) Partner that was in charge of storage at the primary in-country warehouse. The foods were then transferred to smaller Private Volunteer Organizations (PVOs) prior to distribution.⁴ Figure 1 below illustrates the main steps in the last mile in the context of the three FAQR studies in Malawi, Burkina Faso, and Sierra Leone, and highlights the stakeholders having responsibility and ownership at each step.

Figure 1: The last mile in the context of the three FAQR studies in Southern Malawi, Northeastern Burkina Faso, and Southern Sierra Leone



⁴ For consistency in the context of this report, the organization that receives the foods from the donor will be identified as the IP and the organizations that are in charge of distributing the foods to the beneficiaries will be referred to as PVOs. Both are implementing partners and involved in programming. However, in general the IP has more of an overall logistics management role (i.e., procurement, transport to the main in-country warehouse, storage), while the PVOs are familiar with the local environment, work out the details of the distribution, and manage the flow of commodities to make sure that the right amounts are brought to the distribution sites. When the foods are received by an organization that is not involved in the programming aspect of the study but only helps with the logistics of the foods, as was the case in Sierra Leone, they are identified here as a Warehousing and Logistics (W&L) Partner rather than an IP.

In Malawi, a landlocked country, the foods were sent from the United States to a port in Mozambique or sometimes South Africa. The IP's U.S. headquarters was responsible for working with a forwarding agent to organize ocean transport and the transit by road from the port to the primary warehouse in Blantyre, Malawi. The freight forwarder was in charge of clearing customs at the Malawi border and responsible for the foods until delivery at the primary warehouse. However, the IP's in-country office took ownership of the foods as soon as the shipment crossed the Malawi border. The foods were stored at the primary warehouse for a few months, under the supervision of the IP. The PVOs would then contract transporters to pick up the foods and bring them to secondary warehouses located closer to the food distribution points (FDPs). Ownership was transferred to the PVOs as soon as the foods were put on trucks for transfer to the secondary warehouses, but the transporter was responsible for any incidents during transport. Every month, on the day of distribution, the foods would be transported by the PVOs from the secondary warehouse to the FDPs. On occasions, the PVOs would have to hire extra transporters to assist in the transfer to the FDPs.

In Burkina Faso, another landlocked country, the foods arrived from the United States through the ports of Lome, Togo, or Accra, Ghana. At the port, bags of Corn Soy Blend Plus (CSB+) and cases of Fortified Vegetable Oil (FVO) were manually unloaded and transferred onto trucks. Ready-to-Use Supplementary Foods (RUSF), Super Cereal Plus (SC+), and Corn Soy Whey Blend (CSWB) – higher-value products – were kept in the shipping containers, which were loaded onto trucks for transport to Burkina Faso. The freight forwarder was responsible for the foods until delivery to the primary warehouse, but the IP had to meet the freight forwarder at the border to coordinate customs clearance. The IP took ownership once the foods arrived in the primary warehouse. The foods were stored there for several months, until needed for distribution. The PVO in charge of distribution was responsible for contracting a transporter to carry the foods from the primary warehouse to the FDPs. During the dry season, the foods were transported to the FDPs every month and distributed to the beneficiaries as quickly as possible, usually within a few days after being dropped at the sites. In the rainy season, however, many sites became inaccessible to vehicular traffic, so the products were prepositioned at the sites to last through the four-month rainy season.

In Sierra Leone, a coastal country, the W&L Partner met the cargo at its arrival at the port of Freetown. The donor was responsible for hiring the freight forwarder, but they had to coordinate with the W&L Partner to ensure that the necessary paperwork was available at port when the foods arrived. The W&L then transported the foods from the port to their warehouse in Freetown, where a subcontractor examined the foods, weighed them, and produced a report about the overall status of the foods to record any loss or contamination. The W&L Partner then shipped the foods via truck overland to their secondary location, where they stayed until needed for distribution. As the PVO made requests for distribution, the W&L Partner delivered the food to the storage container, located closer to the FDPs. The PVO took ownership and responsibility of the foods once the commodities arrived at the storage container. The PVO then brought the food to the FDPs biweekly for distribution to the recipients.

The study in Sierra Leone also included RUSF and Ready-to-Use Therapeutic Foods (RUTF) produced locally. The W&L Partner managed the procurement process from the local supplier.⁵ Once production was complete, the supplier delivered the commodities to the W&L Partner's warehouse in Freetown. A subcontractor to the W&L Partner took a random sampling of the commodities and sent it to a lab for quality control tests. Once the commodities cleared those tests (a one to two-week process), the commodities were immediately dispatched to the secondary location in Kenema.

IV.b. Partnerships in the Last Mile

IV.b.1. Communication among the Stakeholders Involved

The last mile involves a series of steps that must be well coordinated for successful implementation of the program. Working with different teams has advantages. If one team is new to the country, they can benefit from working with a local office that may have infrastructures available for storage and distribution, know the field, be familiar with local governments and laws, and so on.

In Sierra Leone, the W&L Partner was well established in the region and therefore had access to infrastructures that may not have been easily available to the small PVO that lead the program under study. The W&L Partner also had connections to transporters and officials, which avoided delays. In Burkina Faso, an IP explained that having separation between the team managing the foods and the team working with the recipients allows for cross-checking and can reduce the risk of corruption or theft. Local PVOs that are in close contact and familiar with some of the recipients might give them additional food, favor them in some way, or be unable or uncomfortable turning away people who should not be receiving rations. Having the PVO request the foods from the IP introduces a second layer of scrutiny and reduces the risk of this happening.

However, it is critical to make sure all the players are well integrated in the program and working together to avoid any errors, conflicts, or delays. For example, biweekly meetings proved to be efficient in Burkina Faso for circulating information and resolving issues. However, the PVO in charge of overseeing distribution was part of the Monitoring and Evaluation (M&E) team and therefore did not report to the IP's commodity management team. Therefore, the commodity team did not receive feedback quickly enough after distribution, regarding issues such as changes in the number of recipients, leftover foods at the FDP, and quality or safety concerns.

In Malawi, the M&E team felt they did not receive the same information as the commodity and logistics team, which resulted in confusion. Because the research team had communicated with the IP, the PVOs were not briefed correctly on the study and only learned about the logistics changes as the program was progressing.

⁵ The study in Sierra Leone was unique in that the local supplier was also the PVO. The foods were produced by the PVO at their production plant near the primary warehouse, sent to the primary warehouse managed by the IP for sampling, and then transferred to the secondary location.

In Sierra Leone, coordination efforts had to be reorganized after the study started. The program was implemented in parallel with the local health system, using local clinic sites to distribute the foods. However, the District Health Management Team (DHMT), which was originally in charge of coordinating and communicating with the in-charge nurses responsible for the clinic and its catchment population, was under-staffed and under-resourced. Therefore, the PVO eventually absorbed the responsibility of communicating with in-charge nurses to ensure the smooth management and implementation of the feeding program. This was most likely beneficial to the study, since the PVO knew the program's needs, but a better original assessment of staff capacity might have avoided the need for organizational changes and reduced confusion.

Thus, lack of coordination among many partners can create confusion and affect operational efficiency. Partnership and cooperation between teams with complementary skills and resources can greatly improve the efficacy of a program, but the roles must be clearly defined, and it is critical for the stakeholders involved in the program to communicate with each other continuously to ensure that operations run smoothly. There should be standard communication processes developed and agreed upon at the beginning of the program.

IV.b.2. Oversight and Responsibilities

The stakeholders responsible for the foods at each step of the supply chain must also be clearly identified to avoid conflicts. For example, in Sierra Leone there were some disagreements over responsibilities when the foods were stored before distribution. The storage container was on land shared by the DHMT's medical store. The guards employed by the store initially refused to guard the container and chose not to report when theft from the container occurred. Even after intervention from the DHMT, arguments and tension persisted between the PVO and the guards over their role in protecting the commodities. On another occasion, unwillingness to accept responsibility led to delays in disposing of spoiled foods at the storage container. The W&L driver did not want responsibility for taking any spoiled food back to the warehouse, and the W&L Partner did not want responsibility for managing spoiled food after it left the warehouse. In the end, the PVO took responsibility for disposing of the spoiled foods at the storage container, and the W&L Partner accepted responsibility for the ongoing fumigation and management of the foods in the primary and secondary warehouses.

Confusion can also arise during transport. Implementing partners often have very little oversight during transport, particularly when they contract with transport companies, and it is not always clear who should be held accountable for damage, losses, or delays. Documents are signed each time there is a transfer of ownership and responsibility, and inspections are often conducted to confirm the amount and quality of the products transferred. Waybills and bills of lading indicate that the transporter has received the foods to transport them to the next location and attest to the quantity that they received. At reception, the receiving party can check that the amount of foods that arrived matches the quantity that was given to the transporter. If bags or boxes are missing, the transporter must pay for the foods, but it can result in added complications if, for example, there isn't enough food for distribution.

Even when the responsibilities are clearly defined, there can be debate regarding liability in case of incidents. If the oil cans are leaking, for example, it is difficult to pinpoint who is responsible

for the issue. It might be because of rough handling by the transporter or it might be due to the conditions of the road and inadequate packaging. In Burkina Faso, the foods were once held back for a couple of months at the border because of issues with the products' descriptions on the import documentation. This delay incurred parking fees, which resulted in arguments between the IP and the transporter over who was responsible for paying the fees.

To limit ambiguous situations and conflicts, there must be inspections each time the foods are transferred from one stakeholder to another. The receiving party wants to ensure that the foods they receive are in good conditions so they are not held accountable for any damage. In Sierra Leone, the W&L Partner reported that the PVO complained of damage on several occasions, but they were unable to identify whether the damage occurred during storage at the W&L Partner's warehouse, during transport, or during storage at the PVO's container. They eventually had the PVO send someone to supervise the foods during loading and confirm that the W&L Partner was not responsible for the damage. In addition, they improved communication between the W&L Partner, PVO, and transporter so they could coordinate operations with each other and have complete transparency. In both Burkina Faso and Malawi, independent contractors were hired to act as impartial third parties and confirm the amount received, damage during loading and unloading, the number of bags spoiled, and so on. In Burkina Faso, there were always members of both organizations present when the foods were transferred from one to another, to witness the amount and quality of the foods.

IV.c. Transport Challenges through the Last Mile

Good inland transport is one of the most important aspects of the last mile, but it is very challenging to find reliable transporters. Some of the larger organizations have their own fleet of trucks and other vehicles in some areas, thus managing transport independently. However, this is very expensive, and many IPs and smaller PVOs must contract with private transportation companies, which are not always reliable and who sometimes send trucks that are in poor shape thus exposing the foods to damage, theft, and degradation risks. In Burkina Faso, the team was required to request proposals and review quotes from different companies every two years. They typically looked at the history of the transporter and checked that they had had experience with other food aid programs. However, an issue arose when the team was expected to choose the transporter that provided the lowest quote. In some instances, transporters with less experience give unrealistically low quotes to obtain the contract and then are unable to perform. When this occurred in Burkina Faso, the team had to go back to their original transporter, which had lost the bid renewal due to realistic estimates that were higher than other the other transporter's unrealistic quotes. This wasted time and resources and risked damaging the trusted relationship between the transporter and the team.

In Sierra Leone, the W&L Partner had a fleet of trucks but also contracted private companies as part of their efforts to build local capacity. Similar to the IP in Burkina Faso, they identified companies that they knew had experience transporting foods and were reliable. Because of their well-established relationships, they knew they could count on the transporter to make trucks available as long as they placed the request on time. All the partners interviewed listed their reliable transporters as an extremely valuable strength of their operations.

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Even with reliable transporters, breakdowns leading to delays, and damage due to leaks in the roof or nails on the floor are not uncommon. Some trucks are open-topped, with the foods covered only by a plastic tarp, which might not provide fully weather-proof coverage (Image 1). All the foods are loaded by hand, and staff commonly climb on top of the foods.

Image 1: Community members helping to unload food aid products from a truck in Burkina Faso



Photo credit: FAQR Burkina Faso

The roads are often in poor condition, and the distances traveled are significant. In Burkina Faso, for example, it was 1,000 km from the port to the primary warehouse. The FDPs were an additional 220 to 430 km away from the primary warehouse. Table 2 summarizes the average distances traveled throughout the last mile. Even when the distances traveled are shorter, the quality of the roads can result in significant challenges. Mud and potholes often form on the already uneven roads, thus causing bumps and vibrations that can lead to damage to the foods (Image 2). In Burkina Faso, the villages and FDPs were difficult to access, usually only via dirt roads in very poor conditions that would become completely impassable during the rainy season (Image 3).

Table 2. Estimated average distance traveled by food aid products from delivery at the port to distribution to the beneficiaries				
	Port to primary warehouse	Primary to secondary location	Secondary location to FDP	TOTAL
Malawi	750 km	129 km	40.5 km*	920 km
Burkina Faso	1,000 km	294 km**	N/A	1,294 km
Sierra Leone	302 km	141 km	41 km***	484 km

*Average for 6 sites; minimum = 15 km, maximum = 70 km

**Average for 48 distribution sites; minimum = 220, maximum = 430

*** The team recorded traveling 2,124 km to cover 26 clinics, or an average of 82 km round trip and 41 km to bring the foods to each site.

Image 2: Potholes in Sierra Leone



Photo credit: FAQR Sierra Leone

In Sierra Leone, the roads to the secondary warehouse and the storage container were in good condition and did not cause any issues. However, bringing the foods to the distribution sites was challenging. Seven of the clinic sites were in the area bordering Liberia, across the Moa River. During the period in which the study was conducted, there was no bridge to cross the river. A wooden raft attached to a cable-and-pulley system could ferry vehicles across the river at regular intervals (Image 4). However, during the rainy season (July-September) the river was both too high and too fast for this to be a safe way of traversing the river. The teams then had to leave a day earlier to travel through Bo-Kenema and the Gola National Forest, and the road was often blocked when larger transport trucks sank into the mud.

Image 3: Flooded road in Burkina Faso



Photo credit: FAQR Burkina Faso

Image 4: Makeshift ferry in Sierra Leone



Photo credit: FAQR Sierra Leone

In addition to difficult road conditions, the foods are handled many times throughout the supply chain, which increases the risks of theft, accidents, and deterioration. Rain during unloading and loading operations increases the risk of bags getting wet and can lead to food spoilage. It was also reported that loading/unloading staff at the port or warehouses occasionally dropped the bags on purpose to taste the food or enable the transporter to steal a bag of food. Reducing the number of warehouses through which the foods must transition can minimize handling and thus reduce losses, damage, and delays.

It is important to note that, according to the staff in Burkina Faso, international transport from the United States to Ouagadougou, not in-country transit between the primary warehouse and the FDPs, was responsible for the largest volumes lost. (This did not seem to be the case in Sierra Leone). The IP in Burkina Faso pointed out that in the transport section of the last mile, losses or damages typically impacted only a few boxes of oil or bags at a time, which the transporter was responsible for paying for regardless of the reason. But during international transport, there would sometimes be 200 boxes damaged or lost by the time the foods were received at the port.⁶ The IPs all agreed that containerizing the foods resulted in significantly less damage. In Burkina Faso, the foods deemed “high-value foods” by the transport companies (individually packaged SC+ and RUSF, and experimental product CSWB) were containerized for ocean transport, and at the port the entire container would be transferred onto a truck for transport to the primary warehouse, thus significantly reducing handling and better protecting the foods until they reach the primary warehouse. A few boxes might still have been damaged, but it was typically a lot less than when the foods were transported break-bulk.

⁶ The FAQR team reviewed quarterly Loss Status Reports submitted to USAID by the IPs and PVOs to report and track losses, and the reports seemed to confirm that ocean transport was where most losses occurred. However, losses and damages are very difficult to assess accurately, and there is no reliable data that records damages and losses throughout the supply chain and last mile. There is a general understanding that the volumes damaged are usually underreported. In addition, although the volumes impacted are lower, losses and leakages in the last mile can significantly alter operations and have negative logistical consequences.

Challenges can also arise during customs clearance. Food assistance programs must obtain authorizations to import food aid products from the United States (or other donor countries), and all the paperwork must be up to date at the time the foods arrive at the border (Box 1). The process of customs clearance can be long and requires good coordination between the transporter, the IP, and local and government officials. If an incident occurs and the foods are stalled, the commodities stay in the trucks longer than intended, which can accelerate deterioration of the foods and packaging, and delay the availability of the foods for distribution. Having the necessary exemptions and authorizations before starting to import the supplies is critical to avoiding delays and fees, and the IP must have someone who is familiar with the local regulations.

In Sierra Leone, the W&L Partner had a long, pre-existing relationship with the government and a customs agent to facilitate the process, which mitigated any delays at port or customs. They also had a contract with the laboratory in charge of testing the foods that were produced locally, and once samples were sent to the lab, results were typically obtained within three weeks. For the PVO that was producing the RUSF locally, however, there were myriad delays in getting the ingredients through customs.

In Burkina Faso, the foods needed to be sampled and tested when they crossed the border. The IP eventually built relationships with the laboratory, but originally it could take a few months before getting the results and authorizations for use. In fact, the first shipment was significantly delayed because of a compliance issue. When filling out the paperwork with customs, the IP had declared that they were importing beans, but they received peas. Therefore, they were not compliant, and it took almost a year to resolve the problem, during which the peas could not be distributed. The next time, when describing the products, the IP wrote "vegetables (green peas, beans, lentils...)" to cover all the commodities and "cereals, maize flour, CSB, or dietary supplements" for the flours. In Burkina Faso, they also need to indicate the Best Used By Date (BUBD),

Box 1: Customs Clearance

In Burkina Faso, the IP needed to meet the freight forwarder at the border for customs clearance. Every time a new shipment entered the country, the IP was responsible for coordinating with the National Laboratory of Public Health to take samples at the border so the foods could be tested to prove compliance. The foods could not be used before the **authorization for usage** had been received, a process that could take three months or more. Because the foods are perishable, it was possible to request an **authorization for on-site delivery** so the foods wouldn't have to stay in the trucks for too long, but this had to be requested in advance. Samples were then taken at the border, and the truck was escorted to the primary warehouse by custom agents. The foods were stored at the warehouse, thus reducing the risks of damage and spoilage, but they could not be used or distributed until the laboratory sent the results and the authorization for usage was received.

In Sierra Leone, the W&L Partner worked with a Customs and Forwarding Agent who had the necessary contacts at the port and the Ministry of Foreign Affairs, the Ministry of Finance, and the National Revenue Authority to ensure all of the paperwork was correct, the fees were paid, and the necessary personnel and equipment were available. However, the quality assurance certificates were included in the paperwork provided to Customs and to Foreign Affairs and were accepted in lieu of local quality tests.

production date, and lot number, but it is not always possible to obtain this information from the donor before delivery. If a shipment has been diverted, for example, this information might not be known until the last minute.

Box 2: Takeaway – Logistics, Transport, and Oversight

Food aid programs typically involve multiple stakeholders and therefore require a high level of coordination between the IPs, PVOs, government officials, transporters, contractors, and other stakeholders. Communication channels must be outlined, and transparency between the different stakeholders should be encouraged so that information can circulate efficiently. Roles and responsibilities must be clearly defined to avoid conflicts and delays. IPs must also have a clear understanding of local regulations and build relationships with local officials to avoid delays at customs.

It is also important for the teams and funders to recognize that, when searching for a local contractor, the lowest quote is not always the best option. Rather, they should pay very close attention to the background and realistic capabilities of the contractor when making their selection. Including specific criteria in the calls for proposals would also help to screen some of the companies that would be unable to provide the level of service necessary. This is particularly relevant when hiring a transport company. Environmental conditions and roads in the last mile introduce many challenges, and it is critical to have a transporter that knows how to mitigate the resulting risks.

V. STORAGE AND COMMODITY MANAGEMENT

V.a. Selecting Storage and Distribution Sites

Food aid products stay in storage in-country for months but identifying storage facilities that are large enough and in proper condition to store food products can be challenging. Transport to the primary warehouse is typically part of the donor's freight budget and managed by the freight forwarder, but transport from the main warehouse to the subsequent warehouses and FDPs must be accounted for in the internal budget of the IP and can take up a large portion of the IP's resources. The closer the primary warehouse is to the FDPs, the easier and cheaper inland transport and operations tend to be for the IP and PVO.

When the IP or PVO is already operating in the region, they may already own or contract with warehouses. The W&L Partner in Sierra Leone, for example, had well-established structures and operations. However, this is not always the case, and the warehouses available might not be adequate for the distribution program. In Burkina Faso, the team originally planned to store the foods in a warehouse operated by the PVO in Kaya, which was closer to the distribution sites, but it was too small to accommodate the large quantities of food needed for the study. Therefore, they moved the foods back to Ouagadougou, where they had to store them in smaller, separate

buildings and incur increased costs until they found and were able to move the foods to a large warehouse.

In Malawi, the PVOs already operated warehouses in the regions where distribution took place. The foods were therefore dispatched from the IP's primary warehouse to the PVOs' secondary warehouses, where they were stored until distribution, usually for up to three months. In Burkina Faso, however, the FDPs also served as secondary storage locations. They needed to be within walking distance to the recipients' homes but finding warehouses near the villages was very challenging. The IP's goal was that pregnant women would not have to travel more than 10 km roundtrip to get their foods. However, the villages were far apart and there were few buildings available or large enough for food storage, so some women ended up having to travel 20 km roundtrip to reach the FDP. Secondary locations often were existing structures that had been repurposed, such as schools or unused public buildings, but they were often damaged, not well insulated, and not suited for food storage. They often required repairs, particularly after the rainy season. In Sierra Leone, a shipping container was repurposed into a storage container near the FDPs where the PVO would store the foods for up to a month prior to distribution. It originally did not have proper ventilation, so the PVO had to cut windows and attach a roof to help control the temperature and humidity levels and thus make it suitable for food storage.

In Burkina Faso, to limit the risk of losses, the foods were sent to the secondary locations at the FDPs every month, right before distribution, so the foods wouldn't have to stay in storage there for more than a few days. However, during the rainy season, the villages were inaccessible. The foods were therefore sent to the secondary locations before the rain and had to stay in storage there for four months. This allowed distributions to continue without interruption, but it also meant that the foods were stored in difficult conditions for four months, which introduced significantly higher risk of spoilage. Secondary locations also tended to be less secure and were not always monitored daily by the PVO, so theft was also a threat.

V.b. Storage Challenges

V.b.1. Warehouse Management

Good warehouse and storage practices are key to the preservation of the food quality until distribution. The IP staff in Burkina Faso reported placing the foods on pallets and leaving at least 1 m between the walls and ceiling and the stacks, and between the stacks themselves (Image 5). This ensured good air circulation; prevented the foods from being too close to the roof, where the temperature can be particularly elevated; and allowed the warehouse staff to circulate among the stacks and easily spot issues. It also decreased the spread of infestation (discussed further in Section V.b.2. below). The warehouses were inspected daily. Warehouse workers opened and ventilated the warehouse, checked the stack cards, removed spiderwebs, and cleaned dust that could blend in the flours and contaminate them. However, it is not always possible to follow good warehouse practices, and risks typically increase as the foods move through secondary warehouses (Image 6).

THE LAST MILE OF FOOD AID DISTRIBUTION

Images 5a. and b.: Stacks of FVO (a. left), peas (a. right), and CSB+ (b.) in the primary warehouse in Burkina Faso



Photo credit (a. and b.): FAQR Burkina Faso

Image 6: Storage at the FDP in Burkina Faso



Photo credit: FAQR Burkina Faso

Indeed, the nature of the environment resulted in storage challenges. In addition to infestation risks, denting or rust on cans of FVO could lead to the formation of holes and leaks (Image 7.a.), and rats sometimes ate through the plastic bottles. Because of the heat, the oil in Lipid-based

THE LAST MILE OF FOOD AID DISTRIBUTION

Nutrient Supplements (LNS) separated and sometimes leaked through the seal of the sachets. The humidity caused flours to gain mass, becoming more tightly packed in the bags and favoring spoilage. Boxes of LNS and SC+ sometimes broke during storage because they could not withstand stacking (Image 7.b.). The warehouse staff knew that the boxes shouldn't be stacked more than 10 boxes high, but space constraints sometimes required them to pile the boxes higher than that. The high humidity might also have contributed to the weakening of the boxes.

Images 7a. and b.: Damage to foods during storage: a. Leaking boxes of FVO, b. Broken boxes of LNS



Photo credit (a. and b.): FAQR Burkina Faso

In Burkina Faso, volunteers from the communities were in charge of overseeing the foods while they were stored at the FDP. However, they were not experts in food storage practices and despite receiving trainings on good practices, they did not always follow the guidelines. The volunteers expressed difficulties remembering everything they had learned (discussed further in Section VI.c.2. below). In addition, some were illiterate, and it was difficult for them to fill out logs and documents for commodity management. The W&L Partner in Sierra Leone emphasized the importance of having experienced staff supervise the storage facilities to ensure that proper warehouse practices are followed.

Theft can also be an issue, particularly in areas of conflict or political instability. The access to the warehouses needs to be secure, and some IPs and PVOs hire a guard overnight. In Burkina Faso, the foods were prepositioned at the FDPs during the four-month rainy season, but this is not always possible. In regions of conflict or situations of lawlessness, foods are often stolen. For example, in Burkina Faso during the popular uprising, some warehouses used by another program's IP were attacked and pillaged. Other solutions are sometimes possible: one partner interviewed said they had stationed 40 ft shipping containers protected with wires at the sites in a zone that was less stable. The modalities for storage and prepositioning at the FDPs vary greatly and often must be determined on a case-by-case basis depending on the environment, structures, and resources available.

V.b.2. Infestation

Infestation is among the main challenges during storage. It is not uncommon for the bags to arrive from the port already infested with weevils, most likely because the ships transport a lot of different goods and are not always very clean. Infestation also happens in the warehouses and is triggered by the hot, humid environment and bad storage conditions, including dirty or damaged warehouses and foods stored too close to the wall or ceiling or directly on the floor. If the immediate surroundings of the warehouse are not well maintained, it can also attract rats and pests. However, infestation occurs even in the cleanest warehouses.

It is extremely important that the products are fumigated as soon as infestation is noticed, so that it does not get out of control. At the primary warehouse in Burkina Faso, for example, fumigation was done at least twice a year, but if infestation was observed during a daily inspection, they would call the fumigation services and, if needed, do an extra round of treatment. This happened a handful of times during the three years of the research. In Malawi, the warehouses were fumigated before the arrival of a new shipment. In Sierra Leone, fumigation was done on the foods as soon as any signs of pests were noticed. In addition, they sprayed the alleys between the stacks with a different insecticide, to target pests attempting to go from one stack to the next. Leaving alleys between the stacks thus also helps to reduce infestation. Since the foods were often moved from the storage container to the main office for staging prior to being loaded into the land cruiser for distribution, the office was also fumigated.

There have been efforts to find natural solutions to infestation, including using cats and snakes to chase mice and rats. However, infestation remains a big challenge, and fumigation is usually the best solution to contain it. Yet, fumigation kills insects but not their eggs, so it is still common to find insect pests when opening food bags. When the foods, particularly the flours, are repackaged or reconditioned,⁷ they are generally sifted prior to being transferred to the new packaging to eliminate pests; however, the eggs go undetected. Thus, the flours can still be contaminated, and pests can be present at the time of distribution or consumption, when the eggs have had time to hatch. IPs indicated that infestation was even found in unopened, unadulterated 25 kg multiwall paper bags, and the IPs suspected that the eggs got through during the original packaging processes and developed during freight, inland transport, or in-country storage.

The risk of infestation often increases as the foods are stored further down the supply chain and as storage conditions degrade. In Burkina Faso, to limit the risk of damage and infestation, the team did not repackage the foods that had to be prepositioned during the rainy season and sent only the foods that were in the best condition for prepositioning – those with no packaging damage and no trace of infestation. In Sierra Leone, however, the W&L Partner managed a large warehouse and was concerned that having the foods remain there too long would promote the spread of infestation from an infested stack to the rest of the commodities. They wanted the commodities to be moved directly to the storage container, which was in good condition and therefore would adequately protect the foods during storage. However, the storage container

⁷ Repackaging means that the foods are transferred to a new packaging to facilitate operations, distribution, storage, etc., while reconditioning is the transfer of the foods to a new packaging to prevent losses due to damage to the original packaging.

was too small, so the PVO was forced to leave the foods at the W&L Partner's warehouse during most of the in-country storage time and to request food every two to four weeks.

V.b.3. Managing Shelf Life

To minimize the risk of losses, the warehouse management team uses the first-in, first-out principle⁸ and observes the Best Used By Date (BUBD) to ensure that the oldest foods are used first. Documents must be established to track the foods that arrive and depart the warehouses, including the foods that are distributed. Staff and volunteers must be trained to fill out the forms completely. In Burkina Faso, where they developed a table for recording food amounts and BUBDs in order to track which lots had to be used in priority, they never had an issue with the foods going past the BUBD. In Sierra Leone, the W&L Partner, a very large organization, used commodity management software to track the foods.

However, the BUBD can leave room for interpretation and the IPs also learn from experience. The shelf life of the foods has been established when they are stored at 30 degrees Celsius (86 degrees Fahrenheit), but where the temperatures are often much higher (Image 8), the BUBD must be adjusted by a few months. For example, the shelf life of CSB+ is listed at 18 months, but its *actual* shelf life when stored in warehouses in recipient countries is closer to 9 months.⁹ In Burkina Faso, there were several reports of the recipients refusing to eat CSWB because it had turned bitter, even though the BUBD had not been reached. This shelf life issue needs to be accounted for when planning distribution and when ordering the foods from the United States. The foods can take up to six months to arrive from the United States, and some recipient countries require at least six months of shelf life at the time the foods go through customs, which does not leave much flexibility. The shelf life and BUBD can therefore become challenges, significantly increasing the risk of the foods going to waste if they are not distributed early. Degradation of their nutrition profile can also occur, decreasing the foods' effectiveness. Restrictions on the number of call forwards possible every year also introduces challenges. Because the first call forward is based on an estimated number of recipients that is not always precise, the IP might not have enough food — or, they might have too much that then stays in the warehouse, resulting in issues with the BUBD.

⁸ The first-in, first-out principle, or FIFO, is a warehouse management rule that dictates that the foods that have been in storage the longest are the first ones used.

⁹ The fact that the actual shelf life of CSB+ is shorter than 18 months was discussed with the team in Burkina Faso, but this is consistent with feedback from virtually every IP, and the issue was brought up at multiple meetings and events with several stakeholders.

Image 8: Recommended vs. actual storage temperature: The box indicates the food should be stored below 30 degrees Celsius (86 degrees Fahrenheit), but the thermometer indicates it was 36 degrees Celsius (97 degrees Fahrenheit) in the warehouse at the time of the picture, which was considered a mild day in Burkina Faso.

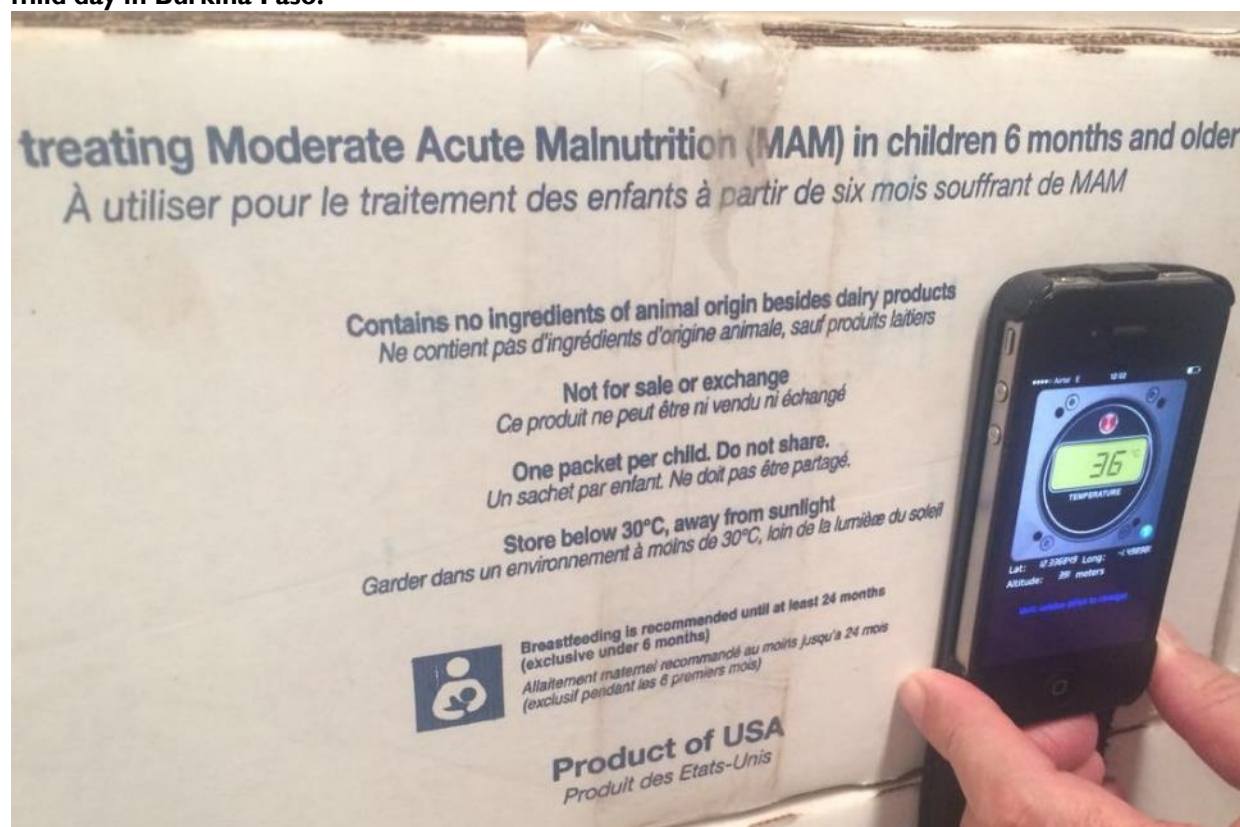


Photo credit: FAQR Burkina Faso

When the commodity management team notices that a lot is getting close to reaching the BUBD, one solution can be to arrange an exchange with another warehouse in the region. However, this is possible only if they use an equivalent product, and it requires the IP to have connections with other partners that are active in the region. It is also easier when both partners receive foods from the same donor; otherwise, there can be confusion and doubts regarding the product. In addition, each organization has its own standards and rules for commodity management and hygiene, which can get tricky when transferring between organizations. For example, despite sifting the flours prior to each distribution in Burkina Faso, when the IP traded CSB+ with another partner in the area, the partner required extra rounds of sifting before accepting the transfer, which incurred additional costs.

If a transfer between programs is not possible, the foods have to be destroyed. Distributing a food past its BUBD could not only damage the donor's, IP's and PVO's reputations, but also have legal consequences if the warehouse or products are inspected by the local government. In Sierra Leone, the W&L Partner explained that when they suspected a lot was no longer edible, they had to call officials from either the Ministry of Health and Sanitation or the Sierra Leone Standards Bureau. If the foods were declared unfit for human consumption but edible by animals, the foods were sold as animal feed to companies nearby. If the foods were unfit for human and animal consumption, the foods were buried or burned.

V.c. Commodity Flow

Good management of the flow of commodities is critical to ensuring that the right amounts of foods are available for distribution without increasing the risk of losses due to shelf life constraints and harsh environmental conditions. Thus, the IPs must order the correct volumes from the donor, and the PVO and IP must accurately assess the number of recipients to optimize the flow of commodities between the primary warehouse and the secondary locations and FDPs.

In Burkina Faso, the IP's deputy chief of party and commodity manager worked together to determine the call forward schedule and order foods from the donor. Because of the high ocean freight cost, the number of call forwards the IP can place is limited, sometimes to a single one per year, to maximize the tonnage. However, it is challenging for some programs to predict enrollment a year in advance. In blanket feeding programs such as the one in Burkina Faso, the number of recipients is usually estimated based on fertility rates. It takes about six months to receive the foods from the donor, so IPs most often place the call forward before all the recipients are born and registered. Limiting the number of call forwards can thus increase the risk of commodity shortages or, more likely, the risk of having extra commodities that can be subject to spoilage, infestation, or exceeding the BUBD.

Managing the flow between the primary warehouse and the secondary locations is also critical, particularly in locations where storage conditions further down the supply chain are inferior and where space is limited. Knowing the burn rate — how much food is distributed and at what frequency — allows the IP and PVO to organize transfers from the primary warehouse to the secondary locations and FDPs. At the beginning of a program, particularly for blanket feeding programs, it is often difficult to be accurate because the IP does not know exactly how many recipients will show up for distribution. During the peak of the program, there may only be a 5-10 percent variance maximum in the number of recipients. So, then there is a better chance of bringing the right amount of food to the FDP, thus avoiding large amounts of leftovers after distribution and decreasing the risk of spoilage. But because the process is often a collaboration among multiple organizations, with one IP managing the commodities and one or more PVOs recruiting recipients and organizing distribution, it is sometimes difficult to know the number of recipients quickly after distribution in order to adjust the next delivery.

In Burkina Faso, the PVO was in charge of requesting the appropriate quantities of each commodity from the IP to send to the FDPs. Originally, the M&E team would inform the logistics team about the number of recipients expected at each site every month, and the logistics team would request the quantity of food from the IP based on this number. However, not all recipients came to every distribution, and some food would be left over from the previous month's distribution, which resulted in excess quantities of foods at the FDPs. The team eventually started adjusting the purchase orders to account for the food that was left at the FDP. The PVO's logistics coordinator received information from the health and nutrition promoters and the M&E team about what was left over at the sites from the last distribution and the number of recipients expected at the next distribution. With this information, the coordinator created a purchase order and sent it to the IP's commodity manager, who approved the order and informed the warehouse manager of the appropriate quantities to send. The logistics coordinator worked

directly with the transporter to supervise the transportation process and ensure that the correct quantities and commodities were placed onto each truck.

This was not as much of an issue in Sierra Leone, where the program was on a much smaller scale, distribution occurred in bi-weekly cycles, and the storage container was in good condition. The PVO could project two weeks into the future relatively easily, to determine how much food would be needed with a buffer to account for potential new beneficiaries. When the supply in the storage container fell below what was needed for the next two-week cycle, the PVO would email the W&L Partner to request the quantity of each food that needed to be delivered for the next month. The food would usually be delivered within three business days of the request.

However, estimating the number of recipients was challenging in Sierra Leone. Normally, supplementary feeding programs are run in areas with a sufficiently high caseload to warrant the program expense. When the initial scoping for the study was conducted, the advance team looked at the official statistics, which indicated there was a high rate of moderate–acute malnutrition (MAM) that justified the implementation of the program; however, they did not conduct independent verification. Unfortunately, the data were unreliable for nearly all sites, because of a lack of technical support for in-charge nurses to accurately identify and report cases of acute malnutrition. As a result, at the end of the study the PVO would sometimes travel to a FDP and not find any recipients, thus wasting resources.

Box 3: Takeaway – Storage and Commodity Management

Despite implementation of good warehouse practices and respect of storage guidelines, in-country storage remains a challenge due to the nature of the environment. Infestation is almost unavoidable, and the high temperature and humidity promote food degradation. Limiting the amount of time that the foods spend in-country could therefore significantly limit risks of spoilage and degradation. Being able to adjust the call-forward schedule and order foods from the donor more regularly could facilitate commodity management. It would increase shipping and logistics costs but would reduce the risk of foods being wasted because of long storage in challenging environments. Alternatively, a system where the foods would come from a foreign pre-positioning warehouse rather than from the United States directly could enable IPs to place call-forwards more frequently without increasing ocean freight and could decrease the amount of time the foods stay in in-country storage. It would also reduce shipping time after the IPs place the order and therefore decrease the need for the IPs to order food before they have an accurate estimate of the number of recipients and amounts needed.

VI. DISTRIBUTION¹⁰

VI.a. Repackaging

Some IPs and PVOs choose to repackage the foods into individual ration size containers to facilitate distribution and food usage. In Sierra Leone, the PVO staff repackaged FVO at the storage container often a couple of weeks before distribution. In Malawi, the recipients were given a bottle at the first distribution and were asked to bring it back for refill at subsequent distributions. Prior to the monthly distribution, contractors hired by the PVOs would come to the warehouses and premeasure the oil rations (Image 9.a.). The premeasured FVO was then transferred to the recipients' bottles at the FDP. One arm of the study also required CSB to be repackaged from the 25 kg bags to 2 kg ration bags. (Each recipient received four 2 kg bags at a time.) The foods were sent to a co-packer in the area at the beginning of the study. The co-packer repackaged the amount of food needed for the duration of this branch of the study (four months). In Burkina Faso, each month the CSB+ and CSWB were transferred to individual sachets at the IP's primary warehouse by workers contracted for the task (Image 9.b.). Repackaging operations are further described in Annex 3.

Images 9a. and b.: Repackaged food aid products for distribution: a. Premeasured FVO in Malawi, b. Repackaged CSB+ in Burkina Faso



a. Photo credit: FAQR Malawi



b. Photo credit: FAQR Burkina Faso

All the stakeholders that were interviewed agreed that repackaging makes distribution easier and reduces food safety risks when distributing on-site from large bags and cans. Even when the foods are repackaged in the warehouse rather than in a packing facility, the IP or PVO has oversight and can ensure that good practices are followed. When foods are transferred to the recipients' containers at the FDP or in the villages, it is a lot more difficult to ensure that the correct precautions are taken. When the foods are repackaged, recipients do not need to bring their own containers, thus reducing the risk of contamination. In the case of FVO distribution in Malawi, even if the recipients had to bring their own containers back, they were originally provided with a new bottle designed for oil storage. The fact that premeasured FVO simply needed to be poured

¹⁰ Annex 4 provides some information on the organization of distribution in the three studies.

from one bottle to the recipient's reduced the risk of contamination at the FDP and ensured that ration size was accurate.

Repackaging also makes distribution a lot faster than scooping or grouping. In programs where food was distributed to both children and mothers, as was the case in Burkina Faso, repackaging decreased the risk of ration diversion or confusion: based on the size of the bags, it was clear whether it was for a child or a mother. It also avoids any potential conflict between beneficiaries if the foods are not divided perfectly evenly during grouping. Although not perfect, repackaging also makes ration sizing more precise. In Burkina Faso, scales were available so that CSB+ and CSWB rations could be weighed accurately. At the FDP, rations were usually measured with scoops and cups, resulting in a lot more variation in ration size. Repackaging typically also results in fewer losses than when the recipients share the rations themselves.

However, even if the protocols are followed, risks are introduced every time the foods are handled and the bags are opened. It is not always possible to see and control dirt or dust, and repackaging can contaminate the foods, particularly when it is done in the warehouses. The bags or bottles used for repackaging are typically of lesser quality than the original containers, and therefore the foods should not stay in storage for extended periods of time once repackaged. This makes it important to estimate the number of recipients accurately for that specific distribution cycle. It is also why, in Burkina Faso, the flours were kept in the original 25 kg multiwall paper bags when they were prepositioned at the FDP during the four-month rainy season. Flour rations repackaged in individual sachets could not have withstood storage at the FDP and would have spoiled and become infested. In Malawi, although the beneficiaries were given a bottle the first time they came to distribution, they did not always wash it properly prior to coming for the next distributions. Therefore, some cleanliness concerns remained or the PVO had to wash the bottles at the site. The bottles were also transparent, which most likely accelerated the degradation of the nutrition profile of FVO.¹¹ Repackaging can also cause a loss of traceability if the PVO does not write down the name of the food, the lot number, and the BUBD.

In addition, the IPs and PVOs must dedicate a lot of time and resources to repackaging. They need to find workers and to make significant organizational adjustments to manage the extra labor. In Malawi, there were times where repackaging had to be done on the day of distribution and resulted in delays. The IPs also need to procure packaging material, but it is not always available on the local market and needs to be ordered in advance so they can repack regularly. In Malawi, repackaging of FVO resulted in significant transport cost increases. FVO packed in bottles used a lot more space and required two trucks where they could previously use one. In addition, although there is less actual loss when the foods are repackaged than when distribution is done by scooping or grouping, the PVO is responsible for the losses that do occur. However, when the recipients share the foods at the FDP, the PVO records that they gave one bag to a certain number of recipients, and the losses that happen during sharing are no longer the PVO's responsibility.

¹¹ No studies have been conducted to assess the nutrition profile of FVO at the time of consumption, but the lipids vitamin D and vitamin A contained in FVO are sensitive to light and oxidation. FVO is therefore better protected in metal cans than in transparent plastic bottles.

In addition, there were sometimes repackaging errors. If the workers put slightly less into each individual bag, they could end up with more small bags than they should have, making it look like “gains.” On the contrary, if they consistently put a slightly higher amount in each bag, it could look like a loss. It is also necessary for the workers to weigh the original bags before starting the repackaging operations. Because of moisture variation, there could be some slight variations in the weight of the foods. If the original bags weighed only 24.5 kg instead of 25 kg, the workers might not be able to fill the last pouch and end up recording a loss of 0.5 kg per bag.

In Burkina Faso, repackaging of the flours was seen as a strength even if it did increase costs and require additional resources and organization from the IP and PVO. It facilitated distribution and was believed to be more dignified for the recipients. However, there are also significant drawbacks and not all programs may have the ability to organize repackaging. In Burkina Faso, the IPs were asked what their favorite product was, and they all listed SC+ as their favorite with LNS as a close second (as compared with the flours). They listed the ease of handling and distribution and the reduced risk of infestation and safety concerns as the main reasons, along with the acceptability of SC+ among the population.¹² In Malawi, one PVO that was interviewed declared that they wished oil came repackaged like the flours.

VI.b. Distribution Challenges

VI.b.1. Informing the Recipients

Communicating the distribution date to the recipients can be a challenge. In some programs, the recipients are told to come at specific intervals (i.e., monthly, every two weeks, etc.), but if distribution has to be delayed due to a truck breakdown, rain, or some other incident, it is difficult to communicate the change of date to the recipients. Further, delayed, canceled, or rescheduled distributions can cause the recipients to lose trust in the program. In Burkina Faso, it was common for distribution dates to change at the last minute, most often due to heavy rain, community events (such as funerals, weddings, and meetings) that prevented large numbers of recipients from traveling, or transportation problems that caused the truck not to deliver the foods on time.

Mapping out key avenues of communication is necessary to effectively communicate changes in the schedule. In Sierra Leone, community health workers, clinic nurses, and the local radio stations (used together) were extremely effective. Some PVOs and health workers traveled to the communities to inform the recipients of distribution dates and other program logistics, but since the villages are often hard to reach, this required a lot of time and resources. In Burkina Faso, to avoid confusion, DC members often waited until the foods had arrived at the site and they could confirm that the distribution would happen before communicating the date to the recipients.

Focus group participants reported challenges with poor communication. In Malawi, recipients commonly did not know when to expect the distribution and on occasion would miss the distribution and not receive their rations. In Burkina Faso, if changes had to be made at the last

¹² When compared with the similarly packaged LNS, the SC+ was seen as more desirable by the IP members interviewed because it more closely resembled local products.

minute, recipients sometimes showed up at the site stating they had not been informed of the changes. In Malawi, there were instances when the health promoters were not made aware of the distribution dates and therefore did not communicate the information to the recipients. When the commodity and logistics team then came on the date scheduled for distribution, they had to leave and reschedule because the recipients were not present. There were also incidents of the foods arriving late at the FDP because of transport issues. Once, a truck got stuck in the mud 3 km away from the FDP, and the PVO had to ask the recipients to walk to the truck to collect their rations.

VI.b.2. Attendance and Tracking of Beneficiaries at the FDP

Recipients must sometimes travel long distances to reach the FDP. It requires them to commit a lot of time away from their families, fields, and other duties, which can discourage them from coming to the distribution. Long wait times at the sites are another problem, and recipients sometimes wait for several hours or an entire day to receive their rations. In Sierra Leone, some of the FDPs were near clinics where many services were offered. The team noticed that in these locations, attendance was better because the mothers could also take care of other errands, and recipients who were ill could easily be referred to clinic staff for treatment.¹³

Attendance at the FDPs often fluctuates depending on the season. In Burkina Faso, drastic increases in attendance were noticed during the rainy season because household rations of much greater quantity were given along with the child ration during these months, so it was more worth the recipients' time to travel to the sites. In Malawi, they noticed that the recipients prioritized farming over the malnutrition mass-screening exercises during the rainy season, because it is a labor-intensive period in the field. However, there were also more children trying to get rations, because there was a shortage of food. The W&L Partner in Sierra Leone suggested that because the food is free, it might not seem as important to the mothers and therefore they don't always make going to the distribution a priority.

Keeping track of all the recipients and ensuring that everyone receives the correct ration is also challenging. If a name is misspelled during enrollment, it results in confusion at the FDP when the recipient tries to obtain their rations. In Malawi, one PVO expressed concerns over corruption of the government officials involved in recruiting the recipients, and therefore did not think that the lists were accurate. On some occasions, health promoters in charge of recruitment or DC members used "ghost names" so that they could receive rations themselves. In Burkina Faso, mothers who had not been recruited and enrolled came to distributions hoping to receive foods, and it was difficult for the DC and PVO to turn them away, knowing that they had spent time traveling to and waiting at the FDP.

In Sierra Leone, recipients sometimes pretended to be someone else to get foods at multiple distribution sites. Many villages fell on the border between the study's service areas. Clinics in a geographic cluster were not always held on the same day and with the same staff, so recipients

¹³ There was frequent confusion regarding food distribution and medical treatment. For example, mothers would often wait until distribution days to bring their ill children to a clinic rather than seeking medical treatment at the clinic as soon as the children fell ill. Some would also call and ask the PVO for support in covering the transport costs for seeking additional treatment.

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were able to go to more than one clinic to receive multiple rations. Mothers also worried that they would get in trouble or be fined if they did not go to a clinic, so they sent a neighbor with a different child but with the ration card of the beneficiary child. Arguments sometimes broke out at clinics when mothers were caught “cheating” by fellow recipients, requiring clinic staff to intervene. However, these were not common occurrences. To avoid these situations, some PVOs started using photos to verify that the correct recipient was receiving food.

VI.b.3. Hygiene at the FDP

Sensitizing the recipients to the importance of hygiene is one of the main challenges at the FDP. In a lot of food aid programs, the recipients are asked to bring their own containers to the FDP to receive their foods, but these containers are often dirty or not adequate for food storage (Image 10). Some women bring an old package from a previous distribution, use their clothes to wrap the foods, or reuse an old bucket. These means of carrying and storing the foods prior to consumption does not effectively protect the nutritional quality or microbiological safety of the foods.

Images 10a. and b.: Mothers collecting their oil rations (a.) and CSB+ rations (b.) in Burkina Faso



Photo credit: FAQR Burkina Faso

A lot of the sites also do not have accommodations for recipients to go to the bathroom. Observations revealed that in Burkina Faso, only 19 of the 48 FDPs were equipped with latrines, even though recipients sometimes had to spend the entire day at the site, thus promoting unsanitary practices. In addition, not all FDPs had handwashing stations. One in-charge nurse interviewed in Sierra Leone emphasized the importance of keeping the FDPs clean for safety reasons and in case of an unexpected inspection, but they expressed frustration regarding the amount of work it took. The clinic workers cleaned and organized the sites before distribution and set up water stations and places for recipients to go to the bathroom, but they were

frustrated that recipients did not pay enough attention to hygiene. They reported finding dirty clothes and diapers after the recipients left. They tried asking the PVO to provide funds or to require the mothers to stay after distribution to help clean the clinics, but this was not implemented. They even tried asking mothers to give 500 Leones each to help pay for cleaning. However, while IPs are conscious of the importance of improving hygiene, and in Burkina Faso there were dedicated projects focused on hygiene and sanitation, it remains a challenge.

VI.c. Volunteers and Community Workers

VI.c.1. Selecting the Distribution Committees

Depending on the food aid program, the PVO or health workers can organize distribution, or volunteers from the recipient villages can form a DC. In Burkina Faso, the PVO asked the leaders and elders of each village to select nine villagers that were trustworthy and willing to work voluntarily as part of a group. Villagers who traveled often were not considered, since it was anticipated that they would often not be available for distribution and other activities. The health and nutrition promoters then chose the final members of the DC among the selected villagers. Most distribution sites gathered recipients from four to seven different villages in the area. Usually, the final DC was composed of about five villagers from the main village where the FDP was located, and two villagers from the other locations.

Each member was assigned a specific task, but all the DC members that participated in the focus groups insisted that they helped each other, particularly during distribution. The DC members are responsible for their organization, so the structure of the DC varies from site to site. However, some of the common main roles, were discussed in focus groups with members from different DCs in Burkina Faso, are detailed in Box 4.

In Burkina Faso, DCs were set up to maximize community involvement and minimize program costs. The IP also believed that because the DC members were from the recipient villages and knew most of the recipients, it facilitated communication with the communities. Using DCs also might have lowered the risk of theft. Since the DC members knew each other and were from the same villages, so if one of them stole foods, the others would notice. However, using DCs required the IP and PVO to dedicate a lot of time to training because the DC members were typically not familiar with food storage and distribution practices.

VI.c.2. Challenges Faced by the Distribution Committees

The DC members in Burkina Faso received training on many different topics, such as commodity management, hygiene, how to cook the foods, and how to teach recipients about proper storage and cooking practices. However, the DC members all agreed that the training was not enough considering the scope of their work, and that more frequent refreshers would have been helpful. The training lasted a few days at the beginning of the program and covered everything required, but it was a lot of information to take in. Some members also pointed out that when the training was held during the rainy season, when there is a lot of work to do in the field, it was difficult for them to focus because they were preoccupied by the fact that they were away from their fields.

The IPs and PVOs work to sensitize the DC members to the fact that the foods are intended for specific recipients. Mothers and children received different rations, and only villagers who are enrolled in the program and show proper documentation were entitled to a ration. However, it is sometimes difficult for the DC members, who are part of the villages, to tell their families or neighbors that they are not allowed to get foods. Most of the DC members interviewed reported that once they explained why it was important to follow the protocol, most of the mothers understood. They usually received their rations, and the next time they would come with all their paperwork up-to-date. However, some DC members were afraid of being considered “the enemy,” and a few reported having had issues with women who insulted them or accused them of refusing to give them the rations that they were entitled to. One member reported an instance when a woman’s husband called them, and they had to ask the PVO to solve the conflict.

Preparing for distribution every month requires a significant time commitment, which often conflicts with the DC members’ other obligations. They must meet to receive the shipment, organize distribution, and go find the recipients in the villages to inform them of the

Box 4: Key Roles within the Distribution Committees

- The **committee leader** (president) gets informed of the arrival of the shipment, communicates the information to the other DC members, inspects the shipment with the Head Secretary, and is responsible for signing reports attesting to the quantities received and distributed.
- The **head secretary** inspects the shipment with the President and coordinates signing of the documents by the warehouse keeper, the president, and the driver sign. On distribution day, checks that the recipients are entitled to a ration.
- The **warehouse keeper** opens and closes the warehouse and, on distribution day, brings the rations outside so they can be distributed.
- The **warehouse inspector** watches over the warehouse and verifies inventory after delivery and at the end of distribution.
- **Informers** receive the distribution details from the president and inform recipients of distribution dates and requirements. On distribution day, the informers give tickets to the recipients so that they can receive their rations.
- **Distribution inspectors** oversee distribution practices and inspect the recipients’ notebooks and food tickets with the secretary to ensure that they receive the correct ration.
- **Advisors:** sensitize women on how to prepare the foods, explain why they have to do the weigh-ins, etc.

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distribution. At some FDPs in Burkina Faso, distribution took place from 7:30 a.m. until 5:00 p.m. over several days — often, up to five days at the largest sites. A lot of the DC members worked in the field but had to be absent for several days every month to organize distribution. Some members lived more than 10 km away from the FDP and therefore left their homes very early in the morning to be at the FDP at least one hour before distribution started and wouldn't return until night. During the rainy season, the trip was even more challenging (Image 11).

Image 11: Staff crossing a flooded road in Burkina Faso



Photo credit: FAQR Burkina Faso

Often, DC members and some of the workers feel that the PVO and communities are not supporting them. Originally in Burkina Faso, the village leaders were in charge of supporting the DC members, but as the project progressed, the members felt that the village leaders lost interest. Some volunteers interviewed suggested that they should receive a certificate to recognize the work they did, so that their communities would see the importance of their role and they would leave a legacy. The DC members also felt that they did not receive enough support from the PVO and that all the efforts were directed toward the recipients. They had to buy gasoline to travel to the FDPs and to find the recipients, charging units for their phones, and food and water. They also lacked resources such as tables to organize distribution at the FDPs (Image 12). Their families and neighbors didn't understand how they could be absent for so long without getting paid or receiving anything for their work – not even a ration for their family. As a result, DC members decided to take compensation into their own hands and informed recipients in their zones that they had to pay 100 CFA (~\$0.20) to receive their rations. They

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saw this is a necessity in order to compensate for their time and the personal expenses they were required to dispense in order to distribute the rations to the community. Though the PVO became aware of this practice and attempted to curtail it, the practice continued regardless, due to the necessity for the DC members to maintain their livelihoods while volunteering for the program.

In Sierra Leone, although the health workers were not volunteers, they faced similar issues when they had to travel to the recipients' homes on occasion. They recorded their travel expenses to get reimbursement from the PVO, but arguments arose over the amount that they were owed, which is not an uncommon issue in countries where inflation is high. Non-governmental organizations (NGOs) create price lists for transport reimbursements and other expenses, but they are slow to adjust that price list, which may result in disparities between the budget and the reality. An in-charge nurse explained that although they were employees of the clinics, not volunteers, they thought they would receive some compensation (50,000 Leones per day) for the additional work that resulted from the program. At the time of the interviews, they had not received anything.

Image 12: A DC member using boxes as tables to review paperwork at the FDP



Photo credit: FAQR Burkina Faso

Box 5: Takeaway – Distribution

IPs and volunteers face many site-specific challenges during distribution, and it is therefore difficult to identify one-size-fit-all solutions to address some of the most common challenges (i.e., accessibility to the sites and villages, communication with food aid recipients, hygiene, traceability of foods and recipients, etc.). However, conversations with stakeholders involved in distribution suggest that they often develop systems to adapt to their environment. IPs and volunteers are very creative when using the available resources and giving them more budget flexibility on how to spend these resources could maximize their efficiency. For example, while the use of DCs played a key role in ensuring year-round distribution in Burkina Faso, the significant time commitment and lack of reward for their work caused DC members to lose motivation. Formal recognition of their work through payment or rations has the potential to make up for the time members spend away from their regular activities. This would have a limited impact on program costs but could greatly improve work conditions, satisfaction, and overall performance.

VII. BEYOND DISTRIBUTION

VII.a. Receiving Feedback from the Recipients

Some programs include workers who travel to the communities and the recipients' homes to deliver additional guidance and collect feedback on the recipients' experience with the foods or any difficulties they face. This is also an opportunity to inform or remind the recipients of the next distribution date. When the IP or PVO does not travel to the communities, they often communicate with a point person in the community who then shares the information with the rest of the recipients. However, this is not always sufficient. Because of the multiple partners involved, including PVO staff, IP staff, volunteers, and government workers, it can be challenging to obtain feedback from the recipients.

For example, the IP in Burkina Faso expressed frustration regarding hearing about food quality concerns and other issues days or weeks after it was initially noted. The PVO was in charge of distribution, and the feedback they received did not always circle back to the IP. The PVOs also are not always able to follow up with the recipients. In Burkina Faso, the food monitors were in charge of going to the recipients' homes to gather their comments and observe how the foods were stored and used, but there were only three monitors for 48 FDPs and over 100,000 recipients. Therefore, they were not able to go visit every household, and there was little monitoring once the foods were distributed. For instance, it was unknown whether the foods were stored or cooked properly, shared with other family members or neighbors, or sold on the local market. The food monitors and the health and nutrition promoters are also meant to attend the FDP on days of distribution, giving them an opportunity to interact with the recipients, but it is common for them to be absent due to scheduling conflicts or travel challenges. In Malawi, the

PVOs also found that home monitoring was challenging because the health promoters did not always have the resources (i.e., transport and fuel) to travel to the communities.

VII.b. Recipients' Perspectives

VII.b.1. Traveling to and from the FDP

Recipients from all three studies repeatedly emphasized how grateful they were for being enrolled in the programs, but receiving their rations was challenging nonetheless. During focus groups in Sierra Leone, recipients highlighted traveling to and from the FDP as their main difficulty. Distribution was at 8:00 a.m., so the recipients who didn't live in the village where the FDP was located needed to start walking very early in the morning, and some even had to travel the day before distribution and sleep in the clinic town. There were also occasions when the recipients misunderstood which areas were served by specific clinics and traveled to the wrong clinic, further extending their trip. Some recipients talked about frequent missed visits because they could not find anyone to walk with them and the road was too remote to safely travel alone at an early hour. Others reported paying for transportation to the FDP. For example, one caregiver in Sierra Leone reported paying 50,000 Leones to take a boat before getting a motorcycle to a clinic, an exorbitant sum for these subsistence farming/fishing households. These barriers may prevent some communities from enrolling in the program in the first place.

In addition to challenges due to the distance, recipients often had to spend a few hours at the FDPs to wait for their rations and complete any training or participate in mandatory health status assessments. Some recipients thus spent the entire day away from their homes, families, and fields. Food was not provided at the FDP, so if they didn't bring money to buy food, they went the entire day without eating.¹⁴

VII.b.2. At-home Practices

Recipients usually received detail instructions on how to prepare the foods, including cooking demonstrations. In Sierra Leone, when interviewed during a focus group at the end of the program, recipients remembered all the instructions and seemed to understand that good hygiene practices play a key role in preventing their children from getting sick. However, they highlighted some challenges in putting these instructions into practice. They were told to focus on preparing the food and feeding their child enrolled in the program, but they explained that they have many children and it is not possible to focus on only one. In Burkina Faso, several recipients explained that they could not always prepare the rations three times a day as recommended, especially during the rainy season, when they were often in the field and not at home during the day. In Malawi, recipients felt they had to rush when cooking the porridge because of other responsibilities. Although they knew that the porridge had to be eaten immediately to reduce food safety concerns, it would sometimes sit out before being given to the child.

Understanding instructions regarding food preparation and storage can be challenging as well. In Burkina Faso, recipients sometimes had to bring their child to the FDP, either for health

¹⁴ In Burkina Faso, recipients often made use of this time by selling snacks to those waiting.

assessments required by the study or because the mothers couldn't leave them alone at home; this sometimes cause the mothers to be distracted and miss part of the instructions. Some recipients reported that the instructions were not always given in a language that they spoke or understood the best. They also pointed out that most recipients were illiterate and could not read the instructions on the packaging, so they relied on demonstrations to know how to prepare the foods.

Storage of the foods at home can also introduce food safety risks. It is common for the foods to be stored on the floor, which increases the risk of infestation and contamination. Even when the foods are stored in the original packaging, it is most likely no longer kept hermetically sealed after the first use. Many of the recipients store foods in their own containers, which might not close hermetically or be appropriate for food storage. Recipients are thus not always able to follow preparation and storage guidelines, which might decrease the effectiveness of the foods by promoting nutrient degradation and introduce food safety concerns.

VII.c. Environmental Impact

Packaging waste management is another challenge that arises in the last mile. The beneficiary populations are very creative and have found ways to repurpose the empty packaging: the 1.5 kg bags are reused for plant nurseries; the boxes and cans are used as building materials for doors and roofs; and the larger bags are also reused. Still, the amount of packaging waste is high and remains an issue, particularly for the small bags. There is too much packaging, and not all of it can be repurposed. In Burkina Faso, the PVO interviewed indicated the cans were a relatively small problem, because they rust and eventually degrade or can be reused as building material, charcoal stoves, and other items (Image 13). However, the small bags are more difficult to repurpose and often end up in nature. The presence of a lot of sachets in the field, bearing the donor's logo, can damage the donor's image and reputation. In addition, some countries, such as Burkina Faso, are implementing anti-plastic laws that restrict the type of bags that can enter the country.

To attempt to address the issue, IPs and PVOs often try to come up with waste management strategies. In Burkina Faso and Sierra Leone, they asked beneficiaries to bring the empty sachets back. While they didn't count the returned sachets and could not determine if they were collecting all of them, it was one way to limit the number of sachets that ended up in the field. In Burkina Faso, they also installed small incinerators at all the sites, but this was not ideal since it put fumes in the air. Even if the bags were not all burned or buried, they were in one place rather than being spread out in the field.

However, it required dedication of more resources to household monitoring to ensure that the recipients brought the sachets back. In Sierra Leone, which was a much smaller program with

Image 13: Barbell made of FVO cans



Photo credit: FAQR Sierra Leone

more frequent distributions (bi-weekly instead of monthly), returning the empty sachets worked well, and the recipients who were interviewed also saw it as an opportunity to prove that they hadn't sold the products.

When distribution is done by scooping at the FDP, it is easier to keep track of the number of empty bags and cans, and to collect them after distribution. They can then be sent back to the main warehouse and donated or sold for repurposing. In Burkina Faso, some artisans transformed the bags into sandals, bags, and tiles. The DC members also sold the cartons and were able to build a new warehouse and benches with the money. However, if the recipients asked for bags or boxes, they were given to them.

Moving forward, the IPs are aware of the continuing problem of waste generation and agree that more needs to be invested in waste management.

Box 6: Takeaway – Beyond Distribution

Although all the recipients expressed gratitude to donors and implementing partners, being enrolled in food aid programs does represent a significant time burden for some. Traveling to and from the distribution sites, waiting for their rations and training or sensitization activities, and food preparation at home often require recipients to prioritize the program at the expense of other activities. The program design should consider feasibility from the recipients' perspective. Hygiene remains a challenge, and efforts should continue to sensitize recipients to the importance of proper storage, cooking, and consumption practices. On some occasions, explaining that the foods were used as medicine helped the recipients understand the importance of following good practices. Advocating for the development of foods and packaging systems that promote safe storage and usage should also be encouraged. Dedicating additional resources to home monitoring and follow-up with recipients would help IPs understand the challenges that recipients face. Quality M&E also has the potential to guide decision-makers in designing foods and programs that addresses recipients' needs and practices.

VIII. LAST MILE COSTS

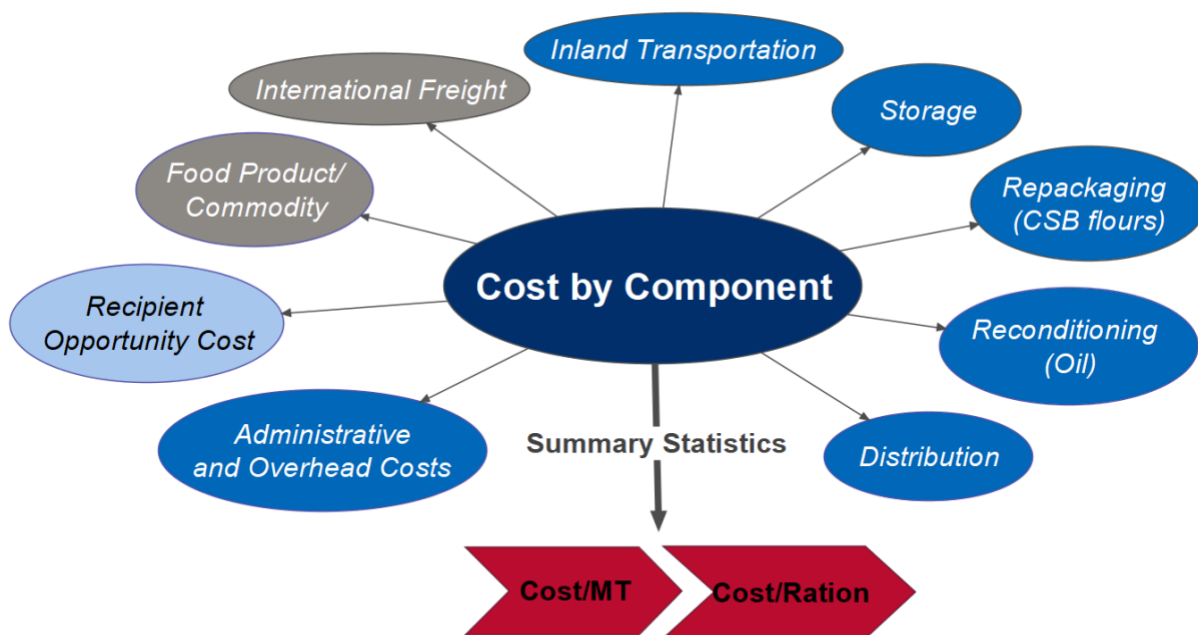
VIII.a. Breakdown of Logistical Costs

The last mile includes several operational steps that must be considered when planning and budgeting a program. The last mile costs, which are typically managed and covered by the PVOs and IPs while the donor is responsible for commodity and international transport costs, do not represent the largest portion of the total cost of a program. Yet, it is necessary for the IPs and PVOs to budget for the last mile so they can request the appropriate funds. They must often evaluate several options in order to identify the most cost-efficient one. The three FAQR studies provide insight on cost considerations but comparing the cost of the different last mile scenarios

is challenging because the environments, distances, and foods in each context were different. The three studies were also conducted over different time periods, and the methods to calculate costs were adjusted based on experience.

The summary cost in Burkina Faso and Malawi were compiled based on several cost components corresponding to the major activities involved (Figure 2).^{15,16}

Figure 2. Cost components to include in summary cost



Legend



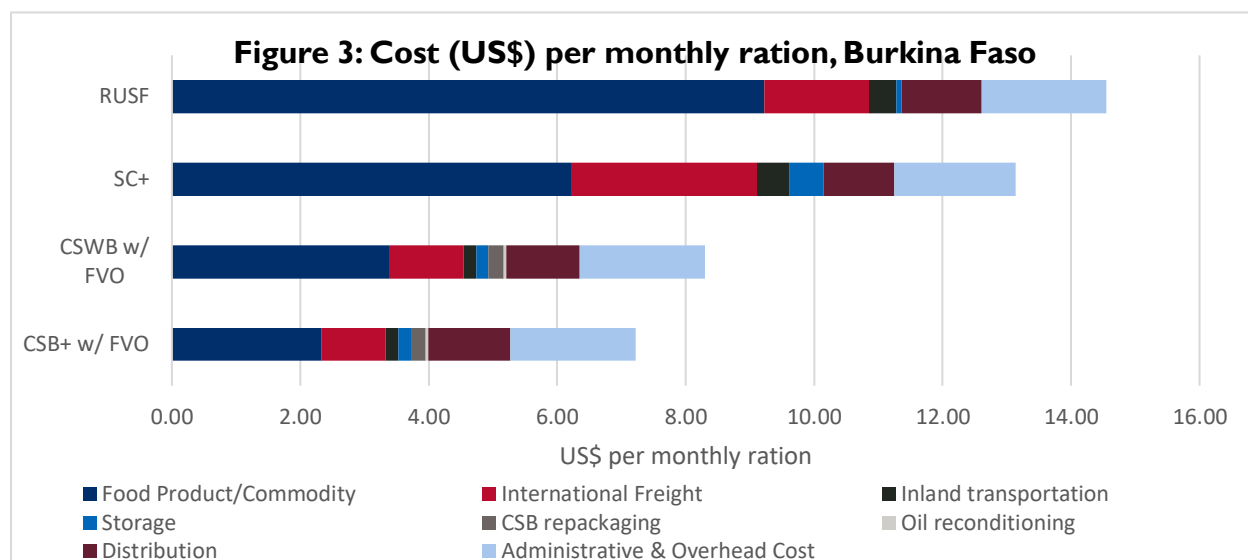
A variety of sources and instruments were used to collect the cost data for these components, including billing and accounting records, warehouse records, realistic quotes, historical data, direct observations, and interviews. Because some of the rations included a combination of two foods (e.g., CSB+ or CSWB with FVO), it was not possible to evaluate the full last mile costs for each food individually. Last mile costs were therefore calculated per monthly ration. Some cost information is summarized on a per MT basis in Annex 5.

In Burkina Faso, with an isocaloric (~500 kcal/day) provision in each study arm, SC+ and RUSF had much higher total cost per monthly ration than CSB+ with FVO and CSWB with FVO, even

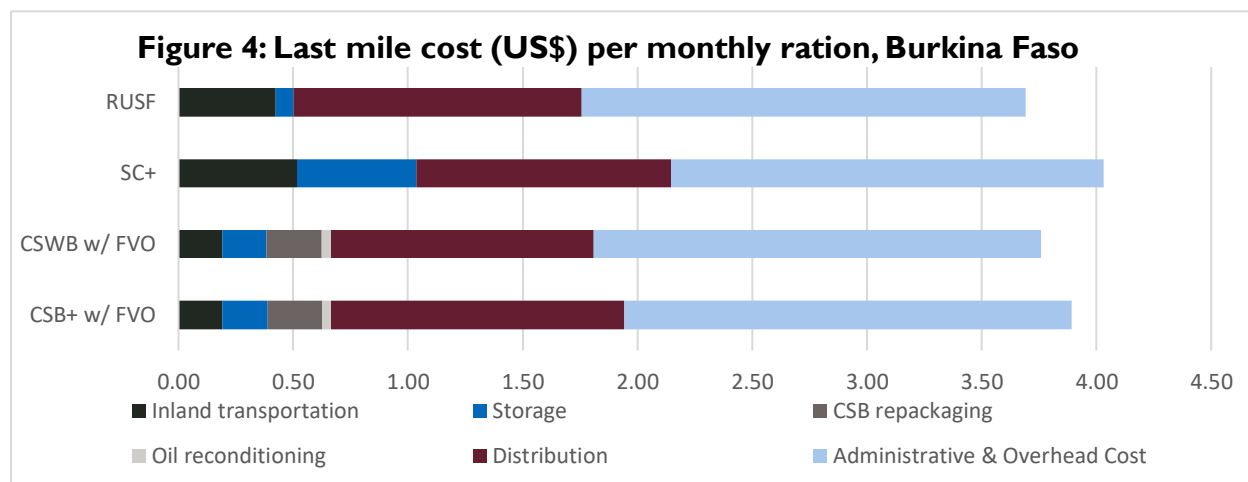
¹⁵ The activity-based costing with ingredients (ABC-I) approach (Drummond, et. al., 2015) was used to calculate the summary cost for each study arm. Reconditioning was not done in Malawi and was done only for FVO in Burkina Faso. Repackaging was done for CSB+ and CSWB in Burkina Faso, and for CSB and FVO in Malawi.

¹⁶ All cost values are presented in 2017 U.S. dollar for Burkina and in 2014 U.S. dollar for Malawi.

though the latter two had additional cost components including reconditioning of the oil and repacking of the flours into small sizes (Figure 3).



The proportion of the last mile components in total cost per monthly ration ranged from 53.9 percent in CSB+ with FVO and 45.3 percent in CSWB with FVO, to 30.7 percent in SC+ and 25.4 percent in RUSF. However, the absolute difference among these last mile components across arms was relatively small (Figure 4). Product/Commodity cost and international freight cost were the main drivers accounting for the differences in total cost among the four arms.



In addition to having the second highest product cost and the highest international freight cost (Figure 3), SC+ arm had the highest last mile supply chain costs per monthly ration due to inland transportation and storage (Figure 4). This can be explained by the fact that the packaging of SC+ took up more space per weight than the other products. In Sierra Leone, for example, an interviewed partner explained that inland transport cost was based on distance traveled per

truck, not on weight. Transporting small quantities of foods that take up a lot of space is therefore less efficient. Among the last mile cost components, Administrative & Overheadcost accounted for about 50% of the last mile cost per monthly ration for each arm (Figure 4).¹⁷ Distribution made up 33% of last mile costs for CSB+ with FVO, 30% for CSWB with FVO, 28% for SC+ and 34% for RUSF.

Despite the fact that the DC members were volunteers, they were essential to the program operations¹⁸ and their time was valued based on the mandated labor law in Burkina Faso, which stated that the minimum wage for agricultural workers is 162.37 CFA per hour, equivalent to US\$ 0.36¹⁹. Therefore, the opportunity cost of the DC members was, on average, US\$ 1.2 per monthly ration, with only very slight variations depending on the foods distributed and was included in the cost of distribution.

In Malawi, there were three study arms, which received different variations of the ration: 8 kg of CSB in bulk and 1 L of FVO (comparison group, standard of care), 8 kg CSB in bulk and 2.6 L of FVO (intervention 1), and four 2 kg bags of CSB and 2.6 L of FVO (intervention 2). The total costs per one-month ration including commodities, international transport, and last mile costs were estimated at US\$ 19.83 in the comparison group, US\$ 29.28 in the first intervention group, and US\$ 31.73 in the second intervention group (Figure 5). Similarly, to what was observed in Burkina Faso, the majority of the cost in all groups came from the commodities and international freight to Malawi. When excluding these costs to look at last mile costs — in-country transport, storage, repackaging, distribution, and personnel — the greatest last mile cost varied by study group

Box 7: Evaluating the Cost of Repackaging

CSB+ and CSWB procured for the Burkina Faso study were packaged in 25 kg bags. To facilitate distribution, these large bags needed to be repackaged into 2.25 kg sachets once they arrived in Burkina Faso. As described in Annex 3, repackaging was done in the primary warehouse by workers contracted by the IP. The material and labor costs (e.g., bags, strings, fixed supplies, storage, and labor contracted at US\$ 0.04 per bag) involved in repackaging were estimated as US\$ 106.2 per MT and US\$ 0.24 per monthly ration for the two arms. In Malawi, the cost of having CSB repackaged in 2 kg sachets and 8 kg monthly bags by a food packer was estimated to be US\$ 3.04 per monthly ration, which included materials (packages and stickers) and labor.

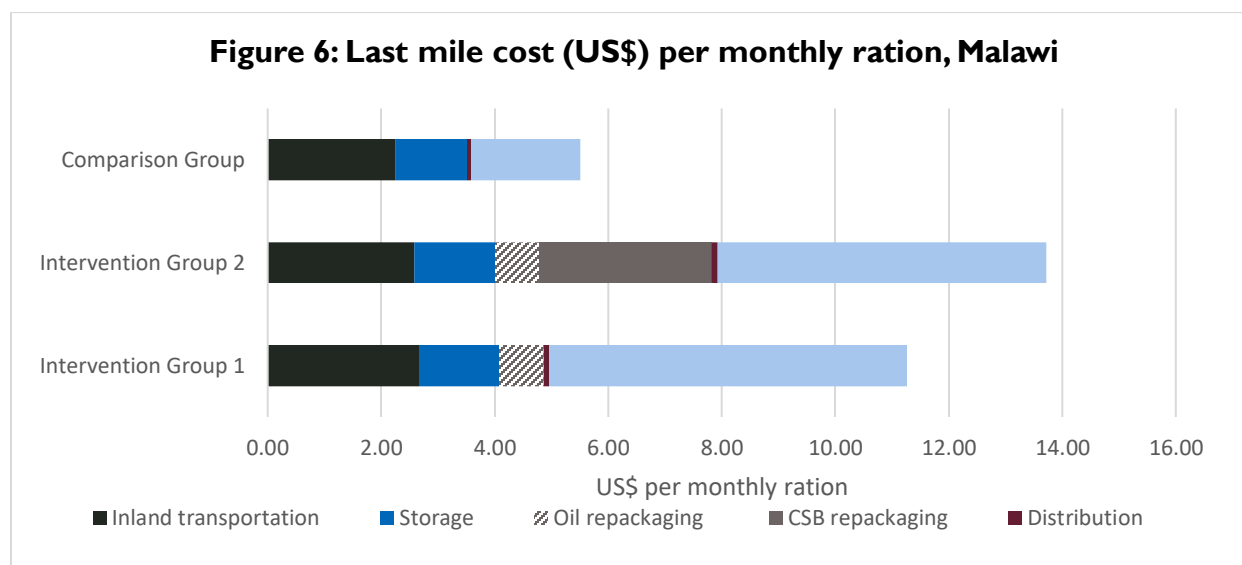
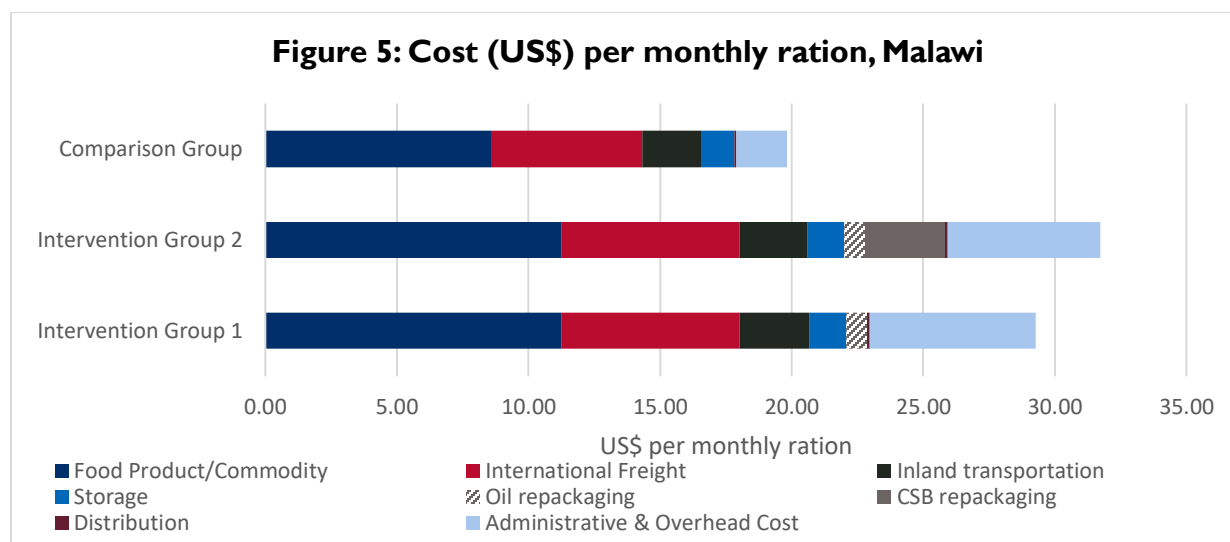
¹⁷ In Burkina Faso, distribution was mostly organized by Distribution Committees. The time of the volunteers was valued using the applicable minimum wage and was included in the distribution costs.

¹⁸ Only the time of the DC members is discussed in this report, but programs that rely on volunteers for distribution or other operations should consider their times when evaluating the cost of the programs. For example, in Burkina Faso and Malawi, lead mothers were volunteers who helped to deliver the social behavior change communication (SBCC) sessions. In Burkina Faso, the opportunity cost of lead mothers was US\$ 0.13 per child reached, which becomes close to 0 once converted to cost per monthly ration, primarily because the SBCC sessions led by the lead mothers were directed at a large number of caregivers at once. The lead mothers are not discussed at length here because they were specific to the FAQR's research goal and not necessarily applicable to all food aid programs. However, they are among the volunteers whose time and efforts must be considered when evaluating the cost of a program.

¹⁹ International Labour Organization (ILO). 2006, cited August 19, 2018. *Burkina Faso Salaire minimum interprofessionnel garanti — Décret n°2006-655/PRES/PM du 29 décembre 2006*. Available from <http://www.ilo.org/dyn/travail/docs/1744/Burkina-SMIG.pdf>

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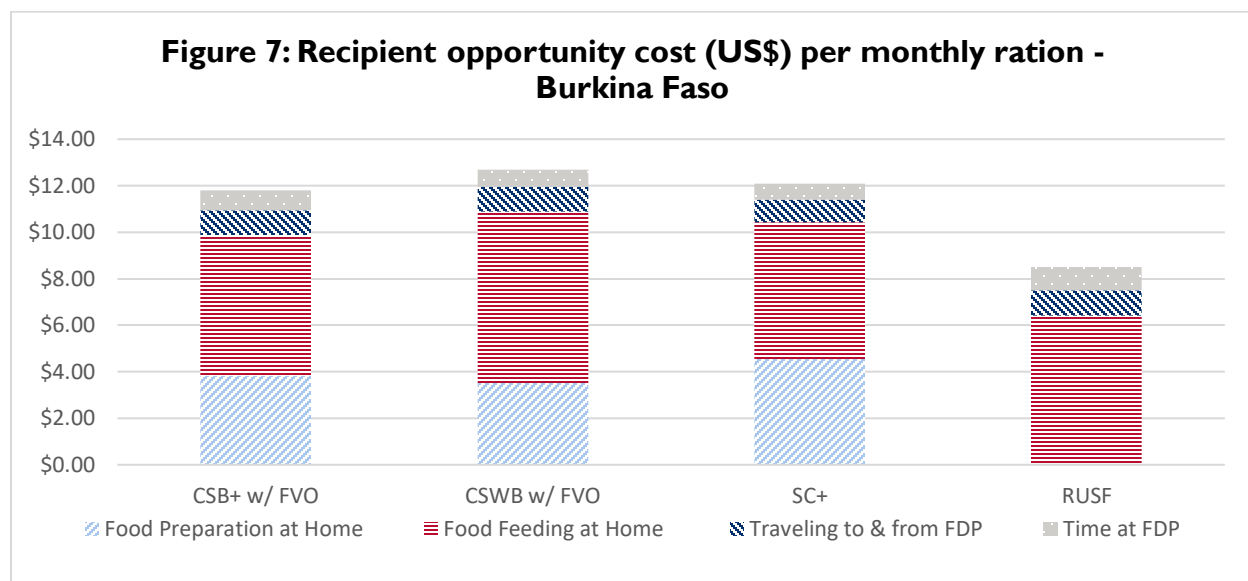
(Figure 6). Personnel were a large cost component of the intervention groups due to the additional training of health workers for the social behavior change communication (SBCC) component of the intervention. In intervention group 2, CSB repackaging — including labor and materials — made up another substantial portion of last mile costs. This differs from repackaging CSB+ and CSWB in Burkina Faso, most likely because in Malawi, CSB was transported to a packing company that was contracted for repackaging, while in Burkina Faso workers were contracted from the villages to repackage the foods in the warehouse (Box 7). In Malawi, the cost of distribution was the smallest component of the last mile costs in all groups.



VIII.b. Recipients' Opportunity Cost

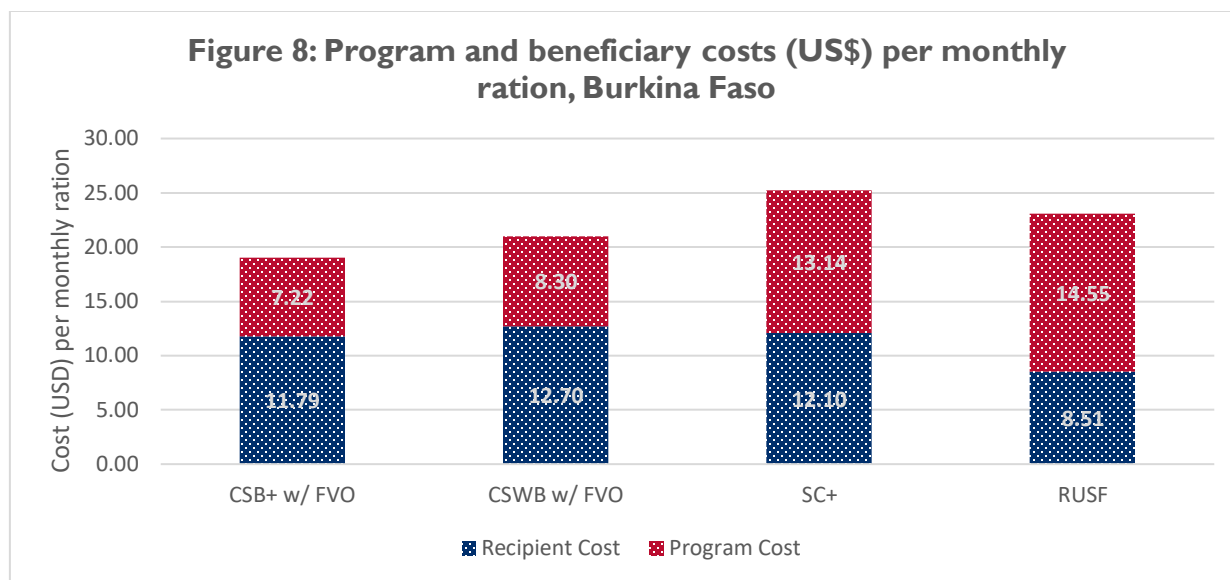
The time that food aid recipients dedicated to the program is not included in the breakdown of last mile costs above, but it was also considered when evaluating the cost in the FAQR studies. In Burkina Faso, the opportunity cost of the recipients' time spent on program-related activities

was estimated based on a shadow hourly wage. The time use data for these four activities were collected from either observations or interviews, and the time was valued based on the minimum wage for agricultural workers. Depending on the specific food, recipients spent a total of 23 to 35 hours per month for program-related activities. The recipient opportunity cost per monthly ration was broken down by recipient activities and is shown in Figure 7.



Both preparation and feeding required a large amount of time because these needed to be done on a daily basis. In contrast, even though time to travel to/from and to stay at the FDP took up to one entire day each time, this was done only monthly. Cost for food preparation was the highest for all three flour-based arms that required porridge preparations. Therefore, RUSF had the lowest total recipient opportunity cost per monthly ration because it required no preparation.

The addition of the recipients' opportunity cost to program cost significantly increased the estimated cost of the monthly ration, especially for the three flour-based arms (Figure 8). It also affected the cost rankings of the four arms. Thus, SC+ became the most expensive arm, and the total cost of RUSF dropped considerably and became less expensive than SC+. Considerations around valuing the recipients' time could have implications for product choices.



VIII.c. Losses and Cost of Reconditioning

Infestation, environmental conditions, and the multiple handling points throughout the supply chain can lead to food losses. The study in Burkina Faso collected information on losses during repackaging, inland transportation, and storage. Overall, losses added up to 6.15 percent of the total volume received for CSWB, 2.28 percent for CSB+, 0.47 percent for oil, 0.03 percent for SC+, and 0.003 percent for RUSF. Most of the CSWB and CSB+ losses were a result of spoilage during storage. However, the impact of the documented losses on cost was found to be minimal once converted to cost per monthly ration. Because all information about losses was from the IP’s routine records rather than the study’s research instruments, it was hard to quality-check whether these records were accurate. There was also no information available on losses that occurred during distribution and at the household level.

In some cases, to salvage the foods that could be lost if left in the original packaging, the foods are reconditioned into a new or recycled packaging to prevent further losses. In Burkina Faso, this was done only for FVO, which was reconditioned into 5 L or 20 L plastic bottles procured locally, depending on availability of the bottles. In this study, 11 percent of the FVO received had to be reconditioned. The cost of reconditioning therefore translated, on average, to an additional US\$ 52.1 per MT of FVO and US\$ 0.04 per monthly ration.

Some argue that the money, time, and effort spent on reconditioning is higher than the value of the FVO and that letting some FVO leak and go to waste might be more cost-effective. However, in Burkina Faso, while reconditioning FVO did add cost, it was calculated that for every US\$ 52.1 per MT of reconditioning cost, a total of US\$ 217.3 per MT would be saved in product, international freight and storage costs. Reconditioning was thus deemed cost-effective.

Box 8: Takeaway – Last Mile Costs

Last mile costs vary greatly depending on the program design and location. The proportion of total cost attributed to last mile depends on the specific program delivery mode. Last mile cost was not substantial for the blanket supplementary feeding setting described in this report, but it remained a critical portion of the supply chain. Lower last mile costs do not reflect the complexity of the operations, nor the burden on volunteers and recipients. When volunteer and recipient time is considered, the cost of a program can change drastically. Mitigating losses and reconditioning require extra labor and can cause delays or inefficiencies. Although the net cost of losses in-country may seem small, the additional operations required can impact the

IX. CONCLUSIONS AND RECOMMENDATIONS

Although the last mile is not the costliest portion of the food aid supply chain, it is a source of many challenges for partners involved in the delivery of food aid products to recipients. Because of the long distances traveled, the many stakeholders involved, and the complexity and variability of the environments encountered, decision-makers might not always fully understand these challenges. As a result, they fail to make adjustments to the design of food aid programs that could improve their efficiency and cost-effectiveness. The last mile must be considered as a key element to food aid programs effectiveness, efficiency and cost-effectiveness.

There are as many last mile scenarios as there are food aid programs, but there are some commonalities that could help to develop context-specific solutions. The FAQR Project was able to gain insight on some of the challenges faced by organizations, volunteers, and food aid recipients once foods arrive in-country.

The FAQR experience underscores the challenges that result from having multiple stakeholders involved in the last mile. Although partners can combine strengths and thus optimize last mile operations, **all stakeholders need to understand the overall program design** and maintain **open and well-defined communication channels**. Meetings gathering all stakeholders at regular intervals throughout the program can contribute to the good circulation of information and avoid confusion. In addition, **responsibilities must be clearly defined in advance to avoid conflicts. Establishing communications channels and decision trees to guide project actions should be prioritized when establishing partnerships at project startup.**

Environmental conditions result in inevitable challenges during storage and transport, both of which are critical to preserving the foods until they reach recipients. Identifying reliable transport companies in the last mile is particularly difficult and finding proper storage structures can be challenging. Following good warehouse practices is not always possible. **IPs and PVOs should be given flexibility when choosing contractors and infrastructures, and donors and funders should recognize that the cheapest options are not always the most cost-effective ones.** In addition, partners and communities often develop valuable context-specific solutions to improve program efficiency.

Volunteers provide an invaluable connection with recipient communities and local environments, but their involvement in the program can be cumbersome and prevent them from fulfilling their other roles and occupations. **Recognizing the importance of the volunteers' role and compensating them for their time would greatly improve their working conditions and encourage their continuous involvement. Implementing partners should develop recognition and compensation structures for volunteers, and funders should support inclusion of these line items in program proposals and budgets.**

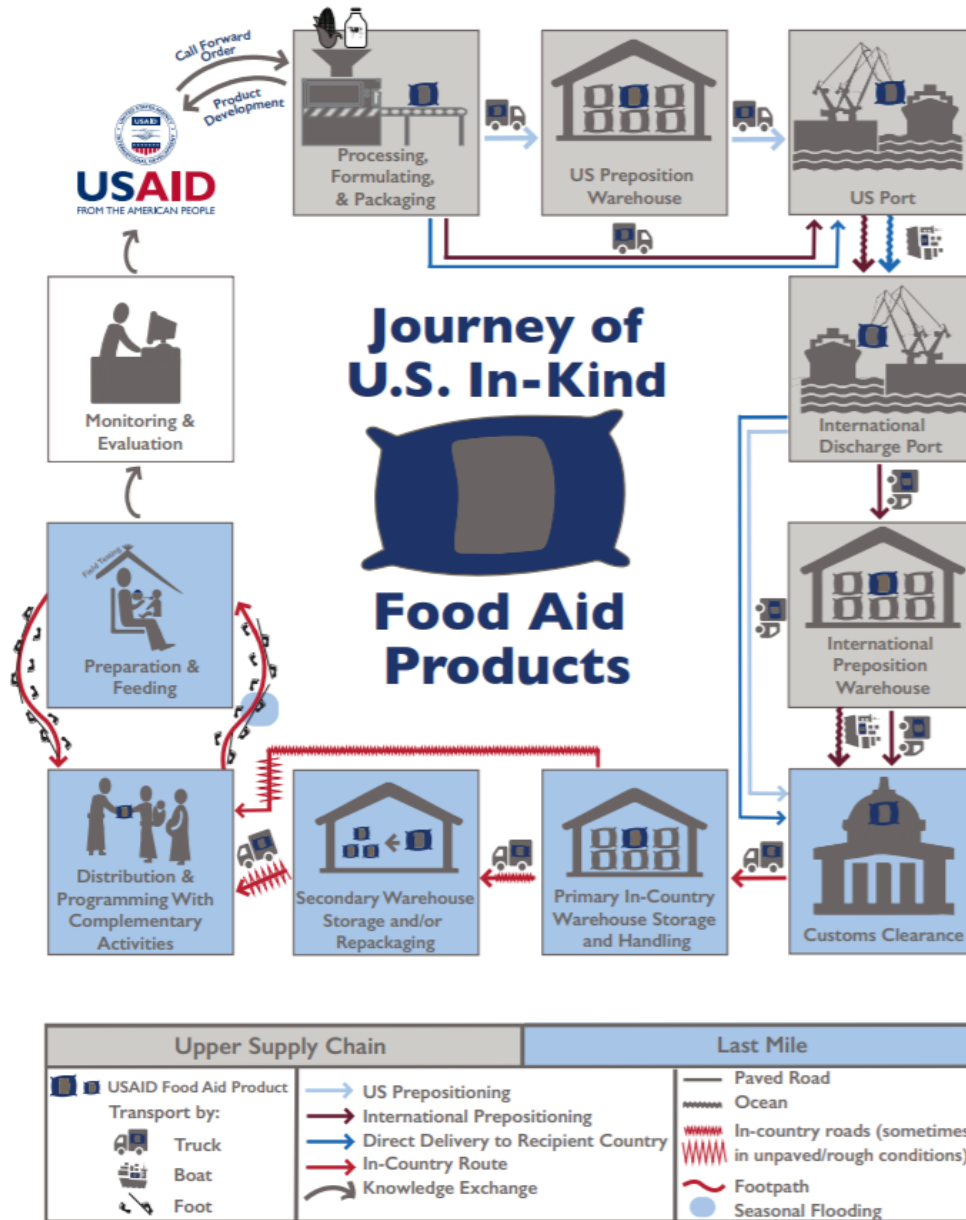
Food aid products provide critical nutrition to malnourished populations, and recipients are grateful to be enrolled in the programs. However, these programs do require recipients to make a significant time commitment. Following program guidelines is critical to the effectiveness of the products, so **directing further resources to understanding recipients' challenges and**

evaluating the feasibility of the programs from the recipients' perspective could help decision-makers design more cost-effective programs. This includes dedicating more resources to home monitoring, continuing sensitization efforts on the importance of hygiene, and developing food systems that promote safe consumption practices.

Although many last mile challenges — climate and environment, road conditions, the remoteness of villages — cannot be controlled, effective planning can help mitigate risks and improve the efficiency of food aid programs. **The exact proportion of total program cost attributed to last mile depends on delivery mode and context. However, even in settings where last mile cost occupies a small proportion, the operations during last mile can significantly affect the programs' cost-effectiveness.** Furthermore, decisions made earlier in the supply chain directly affect the last mile (i.e. call forward schedule, packaging, etc.). Cost-effectiveness should always be evaluated by considering a program in its entirety. Implementing partner organizations, both locally and at headquarters, should continually gather and exchange last mile information and experience will contribute to knowledge building and, over time, lead to the implementation of more efficient and cost-effective food aid programs.

X. ANNEX

X.a. Annex 1: Journey of a U.S. Food Aid Product



FOR MORE INFORMATION GO TO WWW.FOODAIDQUALITY.ORG & WWW.USAID.GOV

X.b. Annex 2: Description of FAQR Studies

X.b.1. Malawi

To design and implement a repeat cross-sectional study through an existing supplementary feeding program for treatment of MAM in Southern Malawi from July 2014 to July 2016, Tufts University

partnered with the Center for Social Research, a research institution within the Faculty of Social Science of the University of Malawi in Zomba; Pakachere Institute of Health and Development Communication; Catholic Relief Services; Project Concern International; Save the Children; Africare; and the Malawi Ministry of Health. The FAQR study was implemented through an existing treatment program, Wellness and Agriculture for Life Advancement, for children 6-59 months of age who were diagnosed with MAM. Caregivers of children enrolled in the program were given four monthly rations of FVO and CSB. This study assessed whether an increased ration of FVO, delivered with SBCC, could influence compliance with the recommended target ratio of 30 g added FVO per 100 g CSB in porridge prepared by caregivers.

Three study groups were compared:

1. A comparison group received the standard of care: four monthly rations of 1 L FVO and 8 kg CSB in bulk.
2. Intervention group 1 received an enhanced oil ration, which allowed preparation of porridge in the target ratio of 30 g oil to 100 g CSB: four monthly rations of 2.6 L FVO and 8 kg CSB in bulk.
3. Intervention group 2 received the enhanced oil ration plus repackaged CSB: four monthly rations of 2.6 L FVO and 8 kg CSB in four 2 kg packages

The main study objectives were to: (1) assess feasibility of the interventions to increase the FVO to CSB ratio in porridge prepared by caregivers, and assess the effectiveness of interventions to achieve that goal; (2) determine the cost and cost-effectiveness of the interventions; and (3) assess potential determinants of effectiveness and cost-effectiveness of the interventions.

X.b.2. Burkina Faso

Tufts University collaborated with Agricultural Cooperative Development International/Volunteers in Overseas Cooperative Assistance (ACDI/VOCA) and Save the Children in Sanmatenga Province, Burkina Faso, to conduct an assessment of the comparative effectiveness and cost-effectiveness of four supplementary foods in preventing stunting and wasting in children 6-23 months of age. In this longitudinal, geographically clustered effectiveness trial, isocaloric amounts of the following foods were compared:

1. CSWB 14, with whey protein concentrate and enhanced micronutrient profile, prepared with FVO
2. RUSF, a generic LNS product aligned with World Health Organization (WHO) recommendations for treatment and prevention of moderate acute malnutrition
3. SC+, the fortified blended food (FBF) that is used by the WFP and that has an enhanced nutrient profile, dairy ingredient (nonfat dry milk), and oil already embedded into the CSB
4. CSB+/SC prepared with FVO

Prior to study implementation, ACDI/VOCA and Save the Children were already conducting a blanket supplementary feeding program called *Victoire sur la Malnutrition*, or ViM, which targeted pregnant and lactating mothers and children under 2 years of age. The FAQR study was embedded into this program. Children whose mothers had been participating in the program were enrolled as they turned 6 months old, and the food ration was transferred from the mother

to the child for their consumption. Once enrolled, each child was measured monthly (recumbent length, weight, and mid-upper arm circumference, or MUAC) for 18 months while receiving food rations, and for 3 subsequent months post-intervention. ACDI/VOCA and Save the Children were responsible for delivering and distributing the food supplements while the Institut de Recherche en Science de la Sante (IRSS) and Tufts University were responsible for enrolling eligible children into the study and conducting data collection.

X.b.3. Sierra Leone

The FAQR study in Sierra Leone sought to determine the relative effectiveness and cost-effectiveness of alternative supplementary foods in the treatment of MAM in normal program settings. The study comparison was based on targeted food delivery to children who were screened for MAM. Study participants received one of four approximately isoenergetic test foods:

1. SC+ with amylase
2. CSB+ and FVO
3. CSWB and FVO
4. Lipid-based RUSF

The goal of the study was to gain insights that will help to guide decisions about what commodities to use in targeted supplementary feeding programs in particular contexts and populations, and what factors need to be addressed to ensure maximum effectiveness in the treatment of MAM. Supplementary food rations were delivered for up to 12 weeks from enrollment, which took place when a child was diagnosed with MAM in accordance with a MUAC >11.5 cm and ≤ 12.5 cm. Caregivers and their children were asked to return to the clinics every two weeks for follow-up, where caretakers reported on the child's clinical symptoms and use of the food at home. At each follow-up visit, growth measurements were reassessed, until the child reached an outcome. A ration of supplementary food sufficient for two weeks (14 days) was distributed at each visit. Children were also monitored for relapse after discharge.

X.c. Annex 3: Description of Repackaging Operations

In Malawi, where the recipients were each receiving 2.6 L of FVO, the team researched locally available packaging options that would be most efficient for prepacking the required volume. Commonly found packaging options included 0.5 L, 2 L, and 5 L bottles. The team researched the possibility of having 2.6 L bottles custom-made for the purpose of the study, but this would have resulted in significantly more expensive packaging. In focus groups, the beneficiaries indicated that they preferred carrying one 5 L bottle rather than two smaller bottles to take their ration home. The team therefore decided to use 5 L bottles and contacted several companies in the area to obtain quotes and identify the most cost-effective option. They avoided bottles with hollow side handles, which are more difficult to clean, and instead chose rectangular bottles with a handle at the neck, to limit the risk of contamination. They also attempted to choose a supplier that would have extra containers readily available, in case they needed to reorder some on short notice. Individual bottles are more difficult to transport to the FDP, so the team also contracted a carpenter to build cases for transport. The cases were custom-made to hold 10 bottles and facilitate loading and unloading, and to enable stacking. (The cases had to be slightly taller than the bottles so that the necks of the bottles wouldn't have to support the weight of the stacks.)

FVO was repackaged monthly at the PVO warehouses by workers contracted for that purpose. Repackaging was usually done the day before distribution. FVO was poured from the original cans into a large tub and then, using a calibrated jug²⁰, transferred into the 5 L bottles. In the field, the beneficiaries were given a bottle the first time they came to distribution and asked to bring back their bottles every month to pick up their ration. They would then receive a bottle of repackaged FVO and pour it into their own bottle. This helped hold beneficiaries accountable for washing their own bottles, and reduced costs and packaging waste by not having to give a new bottle every month.

FVO was also repackaged in Sierra Leone. Because this was a study, the PVO's staff were trained how to use a food scale to ensure that each bottle was filled with the correct amount of oil. The process included three to five PVO staff members who would work in an assembly format, with one emptying the oil into a sanitary plastic bucket, another pouring the oil into the bottles, another to weigh, and another to cap the bottles before placing them in the storage box. This had to be done outside during the day because the process was messy and resulted in a lot of waste. However, the staff found uses for the empty boxes and metal oil containers, for storage or as building materials for structures in the village.

The Burkina Faso warehouse team had originally attempted to repackage FVO as well, but it was too costly because there were no bottles available locally. They also needed cases to transport the bottles after repackaging, but it was complicated to coordinate between the IP and the PVO to bring the cases back to the primary warehouse, where repackaging operations were conducted. Some of the cases would be left at the FDP, while others would break on the way and need to be repurchased. In addition, measuring was not accurate: they had two types of

²⁰ The jugs were pre-oiled to improve accuracy. The team noticed that there was always a small quantity of oil that remained in the jug when pouring. So, they decided to fill the jug with oil, pour it out, and then fill it with 2.6 L. When the oil was then transferred to the beneficiaries' bottle, they received the full ration and did not need to worry about some remaining in the original bottle.

bottles with marks at 0.46 L and 0.75 L, the two different ration sizes, to guide them, but it wasn't very precise, and they sometimes had to estimate. Since repackaging oil was not efficient, the full 4 L cans of oil were sent to the distribution sites, and groups of beneficiaries were given a can of oil to divide evenly among themselves. Group sizes were formed based on the quantity of oil in the monthly ration, so that dividing one 4 L can among one group would equate to each beneficiary receiving the appropriate ration size.

In Malawi, the study design required that, in one study arm, CSB was also repackaged from the original 25 kg paper bags to individual 2 kg bags prior to distribution. The team researched packaging options locally, but none were readily available. They therefore worked with several packaging suppliers in the area to develop a 2 kg pouch that was durable and resistant to water, moisture, and pests, as well as printable, sealable, portable, and with a flat base. In this study, CSB was repackaged by a food packer, so the team needed to ensure that the wrapper would be compatible with the packer's equipment. Each beneficiary was receiving 8 kg of CSB, so they needed to find ration bags that could hold four 2 kg pouches each. Finally, the ration bags were placed in master bags (four ration bags or 48 kg per master bag) for storage and transportation to the field. Because the 2 kg bags were distributed for only four months, all the repackaging was done at one time, before the first distribution. The original bags of CSB were transported to the packer's facility and repackaged into the final bags for distribution.

In Burkina Faso, however, the pouches used to repackage the CSB+ and CSWB rations were of much lesser quality than the original bags and therefore could not remain in the warehouse. Therefore, the IP contracted workers to come to the primary warehouse to repackage the flours each month. The IP also developed a protocol to ensure that good sanitary practices were in place. The contractors had to clean the space and lay clean sheets of plastic or cardboards to cover the floor. They were told to wash their hands and feet, and to wear lab coats, gloves, masks, and hairnets. The flours were then poured into a large tub. If a flour was infested, the contractors would sift it to eliminate pests and reduce infestation before transferring the flour into another tub. Another team would then scoop the "clean" flour, weigh it, and bag it. The bags were sewn and placed back into larger bags for transportation. These large sacks could fit 50 kg and were purchased locally. They were tied with string to hold in the contents, but they were not hermetically sealed.

X.d. Annex 4: Description of Distribution Operations and Main Roles

In Malawi, distribution at each FDP was managed by a **health facilitator** hired by the PVO. The health facilitator oversaw two or three **health promoters**, who were trained to deliver SBCC guidance on storage of the ration, porridge preparation, and feeding to the target child. **Health surveillance agents** — members of the Ministry of Health, which operated the clinics — collaborated with the health promoters. The health promoters were also in charge of traveling to the communities and the beneficiaries' homes to follow-up with them, inquire about issues they faced, and provide additional guidance. Recipient mothers in the communities were divided into care groups (10 households/care group) and were led by a **care group lead mother**, who conducted home visits twice monthly to deliver health messages and monitor the health of household members. The health promoters each trained and managed 5 to 10 lead mothers. There were also **resource persons** in the communities — mothers who had previously gone

through the program and therefore could share their experience and provide additional guidance to the recipients.

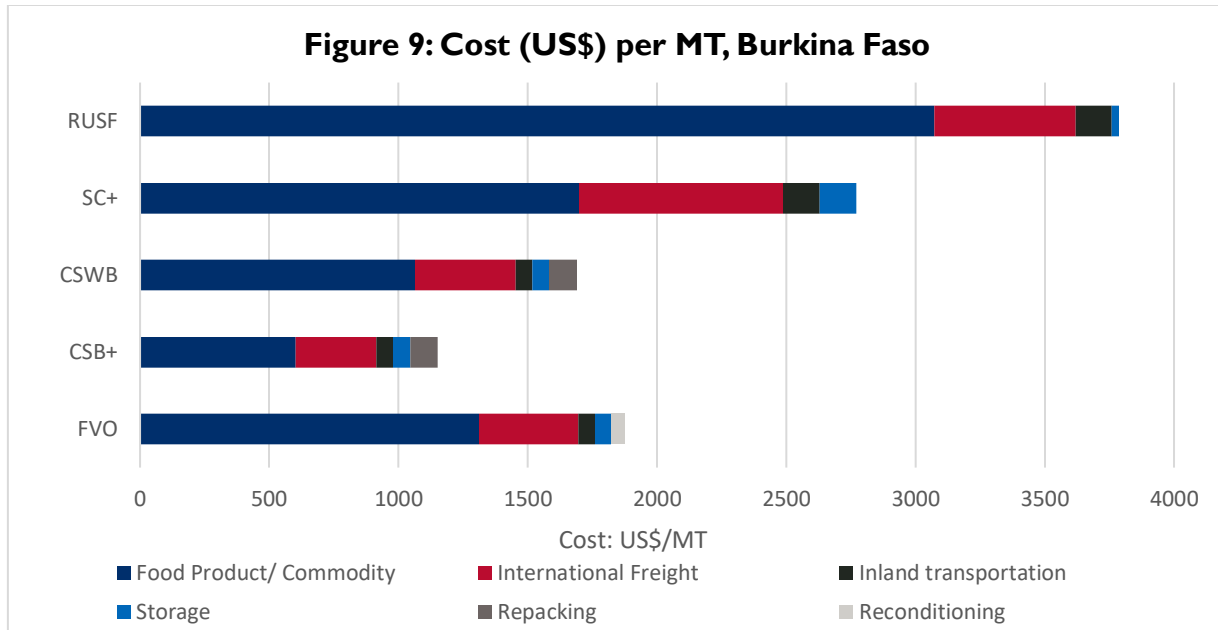
In Burkina Faso, the PVO organized distribution in cooperation with the DCs. The **health and nutrition promoters** were dispersed among the 48 FDPs and were each in charge of a few sites. They worked with the DC members to ensure that the recipients were informed of the distribution dates; conducted training for DCs and lead mothers; and oversaw the distribution processes. The **food monitors** were responsible for checking the conditions of the recipients to make sure they satisfied the requirements to collect the food rations. They also followed up with recipients in the households and at the distribution sites to gather information about their experiences with the foods. The **DCs** were volunteers from the beneficiary villages who helped receive, organize, and stock the foods at the FDP, inform the recipients of the distribution dates, and distribute the foods to the recipients. They were in charge of drafting distribution reports with the aid of the health and nutrition promoters. The **lead mothers** were volunteers selected by the recipient villages to lead care group discussions with small groups of recipients²¹. The lead mothers also relayed information about ration use and other SBCC issues such as hygiene practices, clean water and sanitation practices, and vaccinations.

In Sierra Leone, the local government was involved in the study, and the Ministry of Health worked with the PVO to share national guidelines and context-specific information necessary to the successful design of the program. The **DHMT** provided government-level oversight and responsibility for all health-related activities in the District. Their approval was necessary to gain access to the local clinics, which were government structures. The PVO then managed the commodities in the District and distributed food at clinics while conducting health assessments of each beneficiary prior to distribution. The PVO coordinated with the **W&L Partner** to ensure timely delivery and management of the food supply. The PVO also coordinated with the DHMT to ensure local health protocols were followed and that district health staff were informed of the program. The **clinic in-charge nurses** were responsible for the overall health of their communities and in monitoring the health of children. Nurses helped to provide space for distribution and helped to trace children and families that have missed distribution times. **Community health workers** — government workers who had basic health training and were embedded in the communities — sometimes worked with the local PVO to locate children after missed visits and to screen communities for MAM cases and issue referrals. They could also assist on distribution days to coordinate health sensitization and measurements.

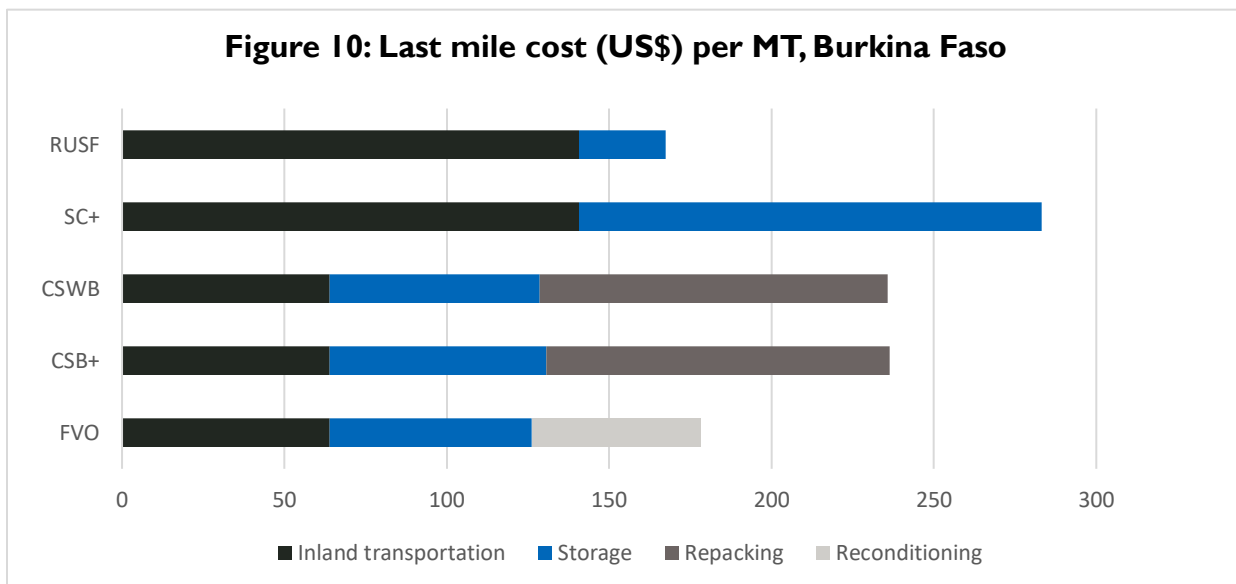
X.e. Annex 5: Additional Last Mile Cost Information

In Burkina Faso, the cost per MT could be calculated for the food aid product and supply chain components because this is a measure directly linked with each product, rather than for each arm (for two of the four arms, a product and a commodity were used in combination). The cost per MT results for the study in Burkina Faso are shown in Figure 9. The food product cost itself constituted the majority of the cost measure with procurement and supply chain components, and the second largest came from international freight.

²¹ Attending a Care group session was a necessary condition for beneficiaries to receive foods.



When excluding these two largest cost components to examine last mile costs in US\$ per MT, we see in Figure 10 that: 1) SC+ and RUSF have higher inland transportation costs; 2) only CSB+ and CSWB needed repacking, but it was the largest component of last mile supply chain costs for these two products; 3) only oil was reconditioned, and associated costs were not substantial; 4) SC+ had much higher storage costs than the other products/commodities; 5) the last mile supply chain cost was the highest for SC+, but the between-arm differences were small given the magnitude of total cost per MT.



ACKNOWLEDGEMENTS

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